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Pharmacy Journal of New England

Dear Readers

The latter part of winter can be cruelest, especially when your state's budget writers turn - once again - to the cost of purchasing and delivering prescription drugs to the poor, to state employees and their families, and state retirees, as that place where deep cuts can be endured. This is the time of year our policy makers ignore the big picture and look coldly at this one cost, desperate to make the numbers work.

As we would with a patient suffering from a severe case of multiple personality disorder, we counsel these policy-makers to take their meds so that they may recall their resolve to demonstrate the value of the face-toface encounter between patient and pharmacist by funding MTM pilots and adherence grants that have served to prove their own point: pharmacist-patient consultation reduces overall health care costs. We remind them that it was they who argued that the local pharmacy is a valuable public health outpost - the place where millions of Americans go each day - and a place where the masses will flock for a vaccine when the threat of a pandemic rears its head. We read their words back to them regarding the scourge of medication waste that is compounded when we opt for simply mailing meds to our patients through automatic re-fill programs, never knowing if these meds are being taken appropriately or simply piling up in a drawer waiting for the day when they will be put out in the trash or flushed down the toilet and into our water supply. "Look at the big picture," we urge them, "so that you do not use the state budget to undermine the physical presence of local pharmacists assisting patients in our communities."

Strikingly similar is the state of support for state pharmacy associations. Their value is unquestionable in the policy arena, and yet when we look at our own budgets, we fall into the same short-sighted temptation to make cuts in places that will hurt us in the long run. Support your state association, and urge your colleagues to do the same. If you have the time, in addition to your dues, offer your time and energy. We are, as you well-know, stronger together.

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Classified Ads

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Electronic records may not provide higher quality patient care

Electronic health records (EHRs) in the U.S. have been strongly associated with benefits to improving patient care. The Institute of Medicine has urged greater use of EHRs to bring health care quality to a higher level. Outpatient physician usage of these records, as well as clinical decision support tools, such as electronic reminders for prescribers, were utilized in a series of surveys, with results published in the Archives of Internal Medicine. Survey data was gathered from physician office and hospital visits between 2005 and 2007. Quality indicators were used to assess the relationship of electronic health records and clinical decision support to the quality of care. While much of the movement within healthcare has been towards fully electronic medical records, a recent survey done by analysts at Stanford University found no consistent association between utilization of the electronic tools and improved quality of care. This data contradicts studies that have used software to subsequently show its potential for health care advancement.

From www.reuters.com/article/idUSTRE70N6IM20110124

Blood drug could help reduce deaths from hemorrhage

Tranexamic acid, the anti-fibrinolytic agent routinely used to treat heavy menstrual bleeding, is coming forth as an attractive option to prevent death in severely bleeding patients. According to the study published in The Cochrane Library journal, the drug has the potential to save more than 70,000 lives worldwide within a single year. Tranexamic acid has generic availability as well as a favorable side effect profile, with some of the more common adverse effects including headache, fatigue, and abdominal pain. Study results were based on a total population of over 20,000 patients. Deaths due to hemorrhage are estimated at over 600,000 worldwide, and prospective use of this medication has been suggested in military injuries, civilian accidents, and other causes of trauma.

From www.reuters.com/article/idUSTRE70I00E20110119

Internet time as an indicator of teen depression

Rates of teenage depression have shown that at least twenty percent of teens experience depression before adulthood. A study published in the Journal of Pediatrics found that in a study of 7,200 teenagers, excessive Internet users as well as non-users were more likely to be depressed. Researchers from the University of Lausanne, Switzerland, surveyed teenagers aged 16 to 20 in 2002 regarding their Internet use and questions related to symptoms of sadness or depression. Heavy Internet use, based on rates of use at that time, was considered more than two hours per day, while regular use could range from several times per week to two hours per day. While the investigators did not report the percentage of the patient population that was deemed depressed, the results found that male heavy users and non-users were one-third more likely to have a higher depression score than regular users. Among teenage girls, heavy users had an 86% greater chance of depression, and non-users had a 46% greater chance of depression than regular users. The study provided basis for further investigation, and several reasons were put forth as hypotheses for association, including insomnia and obesity, but no clear reason for the association could be determined.

From www.reuters.com/article/idUSTRE70H6O120110118

ASHP Applauds Introduction of Drug Shortages Legislation

Bill Gives FDA New Authority to Prevent Shortages

Legislation introduced in February by Sens. Amy Klobuchar (D-Minn.) and Robert Casey (D-Pa.) is a critical first step towards addressing the serious public health threat posed by drug shortages, according to officials at the American Society of Health-System Pharmacists (ASHP).

The "Preserving Access to Live Saving Medications Act" (S 296), gives the Food and Drug Administration new tools to help prevent drug shortages. "Drug shortages present a significant challenge to our health care system and interfere with the quality of care that patients receive in our nation's hospitals," said ASHP Executive Vice President and CEO Henri R. Manasse, Jr., Ph.D., Sc.D. "We are pleased to see a legislative proposal offered to address this critical issue and will advocate strongly for its passage."

ASHP has a long history of leading efforts to help the health care community manage issues related to drug shortages. The Society was a co-convener of a summit in November 2010 that brought together stakeholders to develop recommendations for new approaches to prevent patient harm and minimize disruptions in care caused by drug shortages. The report from the Summit is available at www.ashp.org/drugshortages/summitreport.

ASHP and Summit co-conveners, the American Society of Anesthesiologists, the American Society of Clinical Oncology, and the Institute for Safe Medication Practices, and Summit participant the American Hospital Association advised Klobuchar and Casey as they developed the legislation.

ASHP maintains the Drug Shortages Web Resource Center and published guidelines to help practitioners manage drug product shortages.

Immunization Schedules Updated for Infants, Children, Adolescents

Kate Traynor

The Centers for Disease Control and Prevention (CDC) recently released its annual updates to the recommended immunization schedules for infants, children, and adolescents.

An updated schedule for adults will be released Friday, according to CDC's website.

No new illnesses are targeted in the revised schedules for infants, children, and adolescents. But one vaccine—Wyeth and Pfizer's 7-valent pneumococcal conjugate vaccine, Prevnar—is replaced by the 13-valent version of Prevnar that was approved a year ago.

CDC recommends that Prevnar 13 be used to complete any vaccination series in infants and young children that was started with the 7-valent version of the vaccine.

The revised schedule also adds a booster dose of meningococcal conjugate vaccine that should be given to adolescents at 16 years of age. For children age 2–10 years with persistent complement component deficiency or functional or anatomic asplenia, a routine two-dose primary series of meningococcal conjugate vaccine with a booster dose every five years is now recommended. HIV-infected people, when vaccinated against meningococcal disease, should also receive two doses of meningococcal conjugate vaccine.

The updated schedule provides new guidance on the use of tetanus and diphtheria toxoids and acellular pertussis (Tdap) vaccine in children 7–10 years of age who are incompletely vaccinated against pertussis. A single dose of Tdap is recommended for children in this age group who have not been fully vaccinated against pertussis or whose pertussis vaccination status is not known.

Also addressed in the update is the use of seasonal influenza vaccine in children on the basis of their previous vaccination with monovalent H1N1 influenza vaccine. Two doses of the trivalent vaccine are recommended for all children age 6 months through 8 years who did not previously receive two doses of the monovalent vaccine.

The 2011 schedule also contains detailed guidance on the use of hepatitis B vaccine in children who were not vaccinated against the disease at birth.

USP seeks comments on new standards for prescription labels

Proposed General Chapter <17> promotes safe medication use by making labels easier for patients to understand.

"Take two tablets twice daily"—does that mean two or four tablets total that day? What times should the tablets be taken? Would 8 am and noon be OK? What if the name of the pharmacy is in 13-point font, but the instructions for use are in 8- or 9-point font?

Given the potential for such patient confusion with prescription medication labels, the U.S. Pharmacopeia (USP) has proposed new national standards for the content, language, format, and appearance of the labels.

"We want them to be creative and come up with ideas for what the label could look like," Shawn Becker, MS, RN, USP's Director of Healthcare Quality Standards, told Pharmacist.com.

Process

An Institute of Medicine health literacy initiative led to the proposed USP standards. "It was brought to our attention that there was really a need," Becker said.

In May 2007, the USP Safe Medication Use Expert Committee established the Health Literacy and Prescription Container Labeling Advisory Panel, which presented recommendations to the USP committee in November 2009. General Chapter <17> is based on those recommendations, and cites 37 sources. The advisory panel wrote the standards collaboratively, and USP did general editing.

Regarding the amount of information that USP is suggesting appear on prescription labels, Becker said, "We would expect that pharmacists are going to get back with us and say, 'This isn't realistic. We don't have enough room on the label the way it is right now." She added that USP would also work with the vendors who create the labels and software used in pharmacies.

After the comments are received, if enough substantive changes are needed, USP would call for a second round of comments. If not, this completely new chapter could go in November to the USP–National Formulary (USP–NF) and become official as of May 2012.

States can decide whether to endorse and adopt the USP standards. "If we have standards, it gives [the states] meat—something they can put their teeth into so they can make their laws," Becker said.

Standards

The seven-page proposed chapter offers the following standards:

- Organize the prescription label in a patient-centered manner
- Emphasize instructions and other information important to patients
- Simplify language
- Give explicit instructions
- Include purpose for use
- Limit auxiliary information
- Address limited English proficiency
- Improve readability

For example, instructions for use should say explicitly, "Take 2 tablets in the morning and 2 tablets in the evening," not "Take two tablets twice daily." Also, information critical to safe use of the medication should be placed at the top of the label, while less critical information such as the pharmacy name should be placed at the bottom of the label or in another less prominent location.

"Each state has different things that they allow on their labels," Becker said. "We want them to be similar. We are here for the public health. That's our goal."

Related resource on www.pharmacist.com: FDA meeting: Reducing medication errors, Posted by Diana Yap

Pharmacy Compounding Accreditation Board Names Joe Cabaleiro Executive Director

The Pharmacy Compounding Accreditation Board (PCAB) has named Joe Cabaleiro, R.Ph. as its new Executive Director. As Executive Director, Cabaleiro will lead accreditation programs and initiatives designed to support compounding pharmacies in their efforts to continuously improve quality practices and enhance patient care.

PCAB was established to promote, develop and maintain principles, policies and standards for the practice of pharmacy compounding; provide assistance to all compounding pharmacies seeking accreditation, and to raise the public's awareness of quality pharmacy compounding practices.

"Serving as PCAB's Director of Standards Interpretation for the past five years, Joe is uniquely qualified to assume the position of Executive Director," said Tom Menighan, BSPharm, MBA, ScD, PCAB President and Chief Executive Officer and Executive Vice President of the American Pharmacists Association. "His expertise was vital to the initial development of the organization, and through his PCAB position he has continued to support the organization's management and operation. Joe has been instrumental in determining how PCAB standards are interpreted by pharmacies and surveyors and managing the survey process and effectiveness. On behalf of my peers in all the PCAB founding organizations, we look forward to supporting Joe and the PCAB staff in the continued growth of the organization."

Prior to joining PCAB Cabaleiro held management or consultancy positions in the home infusion therapy field.

He worked for the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) where he conducted homecare program pharmacy surveys and evaluated home infusion organizations against JCAHO's standards. Cabaleiro is the author of several publications on compounding accreditation and is the former owner of a compounding pharmacy. He earned his BSPharm degree from the University of Florida.

"PCAB accreditation gives patients and prescribers a way to select a pharmacy that meets the highest quality standards," says Cabaleiro. "It has been gratifying to be a part of this organization since its inception and to watch as it carried out the establishment of uniform accreditation standards for the compounding profession. I am excited about assuming this new role with PCAB and helping the organization determine new standards to fit the future of compounding pharmacy and its practicing professionals."

About PCAB

The Pharmacy Compounding Accreditation Board is a not-for-profit corporation formed by eight national pharmacy organizations that recognized the need for a national standards organization for compounding pharmacy. Each of these organizations has one representative on the board. The member organizations are: American College of Apothecaries; American Pharmacists Association; International Academy of Compounding Pharmacists; National Alliance of State Pharmacy Associations; National Association of Boards of Pharmacy; National Community Pharmacists Association; National Home Infusion Association and United States Pharmacopeial Convention (USP).

Legislative Developments Federal Judge in Florida Declares Health Care Reform Law Unconstitutional

Judge Roger Vinson of the U.S. District Court for the Northern District of Florida declared recently that the Patient Protection and Affordable Care Act was unconstitutional. Vinson's decision held that the individual insurance mandate exceeded Congress's authority under the commerce clause. Additionally, the court ruled that the individual mandate is "inextricably bound" to the remainder of PPACA, which renders the entire law unconstitutional. Vinson did not issue an injunction to keep the law from being enacted, and the Justice Department plans to appeal the ruling. The law is currently proceeding through other federal courts as well, and is likely to eventually reach the Supreme Court. Republicans in Congress and opponents of the reform law said after the ruling that the judicial decision affirms their commitment to repeal. Read Judge Vinson's full ruling here.

Regulatory Updates

NCQA Releases Patient-Centered Medical Home Standards

The National Committee for Quality Assurance recently released its new standards for the Patient-Centered Medical Home program (PCMH 2011). These standards support federal activity by calling on medical provider groups to use health information technology and focusing on patient relationships, choice and access.

The required areas of focus for prospective medical home designees are access during office hours, use of data for population management, care management, support of a self-care process, referral tracking and follow-up, and continuous quality improvement. The most pharmacist-relevant elements include a provision for medication management and patient/family medication counseling, and a requirement for certain amounts of e-prescribing. In addition, NCQA is working with the Agency for Healthcare Research and Quality to enhance opportunities for patient reporting by adapting the existing Consumer Assessment of Healthcare Providers and Systems (CAHPS) Clinician and Group Survey later this year. Medical homes will be able to receive additional distinction next year by voluntarily reporting patient data from that survey.

Berwick Renominated for Permanent CMS Administrator

President Obama renominated Centers for Medicare & Medicaid Services Administrator Donald Berwick for the position. Because of opposition in the Senate, Obama chose to place Berwick in a recess appointment, which bypassed Senate confirmation but expires at the end of this year. Berwick has served as the head of CMS since April 2010 and also has authority over the Center for Consumer Information and Insurance Oversight, which is charged with implementation of much of the Affordable Care Act.

U.S. News continued

Senate Republicans expressed disappointment at this decision in part because of previous statements Berwick has made regarding healthcare reform. Democratic leadership in the Senate Finance Committee have not yet set a schedule for Berwick's confirmation hearing.

Generic competition expected to be strong as many small-molecule drug brands face patent expirations Drug Topics E-News

Small-molecule drugs in the United States will experience the greatest degree of brand erosion as patents of many of the most popular drugs expire during the next several years, leaving them exposed to generic competition, according to a report published by Datamonitor.

On average, sales will decline by 72% and volume will decline by 70% within 6 months of direct generic competition in the United States, the report said.

More than 80 blockbuster patents are set to expire through 2015. Pfizer will lose patent protection on 8 blockbuster products, including Lipitor (atorvastatin calcium), the best selling drug brand in the world, said Maura Musciacco, a healthcare analyst for Datamonitor. "Once Lipitor goes off patent, it will trigger incredible generic competition," she told Drug Topics. "Many generic manufacturers will fight over getting a piece of the pie of this major drug."

The report looked at patent expiration by country, therapy area, and setting. According to the report, brand erosion was greater in terms of speed and severity in the hospital setting, probably a reflection of greater patient loyalty in the retail setting. By therapy area, erosion of sales and volume was the greatest in the infectious disease, oncology, and cardiovascular categories.

Since the United States is considered the most mature of all generics markets (an estimated \$59 billion in value), it is more susceptible to brand erosion than other countries, Musciacco said.

Following the United States, brand erosion will be most severe in the United Kingdom, Germany, and France. At the other end of the scale, brand erosion will be the lowest in Australia, Italy, Russia, Spain, and Japan.



Bowl of Hygeia finds new home at APhA

Joe Sheffer

The Bowl of Hygeia (replica) has a new home on the National Mall with the recent transfer of this prestigious award from National Alliance of State Pharmacy Associations (NASPA) and Pfizer to APhA for placement in the Association's Awards Gallery. Last year, Pfizer transferred all rights and responsibilities of the award program to NASPA, including possession of the Bowl of Hygeia replica that was housed at the corporate headquarters of the sponsoring company. The original Bowl of Hygeia award is housed in the A.H. Robins family collection. APhA is gratified to maintain stewardship of the Bowl replica on NASPA's behalf. For more than 50 years, the Bowl of Hygeia has recognized pharmacists who are committed to making important contributions to their communities. Each year, pharmacists in all 50 states, the District of Columbia, and Puerto Rico are eligible for the prestigious award. The award itself depicts the traditional symbol of healing through medicine-a symbol that has been associated with pharmacy for thousands of years. In Greek mythology, Hygeia was the goddess of health and the daughter of Aesculapius, the Greek god of medicine.

2010 Recipients of the "Bowl of Hygeia" Award



The Bowl of Hygeia award program was originally developed by the A. H. Robins Company to recognize pharmacists across the nation for outstanding service to their communities. Selected through their respective professional pharmacy associations, each of these dedicated individuals has made uniquely personal contributions to a strong, healthy community which richly deserves both congratulations and our



thanks for their high example. Over the years a number of companies have supported the continuation of this worthwhile program, including Wyeth and Pfizer. The American Pharmacists Association Foundation, the National Alliance of State Pharmacy Associations and the state pharmacy associations have assumed responsibility from Pfizer for continuing this prestigious recognition program. The Bowl of Hygeia is on display in the APhA Awards Gallery located in Washington, DC.



New England States

Connecticut President's Message

A Call to Action

The message that I wish for our group to take forward today is that we are the determining our future now.

What the future holds will be set by our actions.



Our actions as a profession need to be on message and with a strong voice.

Emmett Sullivan, President

Who hears the voice of pharmacists? In your setting, it is your patients. When asked if they want a choice to keep coming to their pharmacists, or be forced to go to mail order, we have gathered over 17,000 patient signatures from a small group of pharmacies. This small group of pharmacies want to be heard beyond the pharmacy. They also do not want to be shut out of their patients lives, by an insurance plan or PBM.

What does it take to be the voice beyond the pharmacy? Sometimes it just means ten minutes when you get a legislative alert. Pick up the phone and call, you do not need to have a perfect understanding to speak with your representative, just be concerned.

Well what does one call mean to these people? In Hartford politics, If they get just TEN to twenty calls on a specific bill, they start paying attention.

"I don't own the pharmacy, my boss handles that stuff..." The regulations that impact your profession are not all financial, but do come at a professional cost. Would you want to call the prescriber every time you switch a patient from one generic to another equivalent generic? I don't, but there are a group of advocates that think we should. If that does become regulated, imagine the records that you would have to keep and other services that would suffer.

"I don't care about the CMS Medicare/Medicaid reimbursement rates, I don't want to get involved in the money side of the profession." The financial and monetary issues are a fact of life. As someone who is responsible for the financial viability of a pharmacy group I know that the two highest costs are drug costs and salaries, followed by benefits. If the rates are cut, then something has to go. These rates impact your compensation even as a staff pharmacist. This holds true for any area of pharmacy practice. For example if the room rate is cut for hospitals, they have less income to cover the pharmacist salaries. For areas with limited CMS influence, the third parties will move down the same path very shortly.

Politics is not your thing, "I went to pharmacy school so I don't have to worry about those people and the issues." To that I answer pharmacy is not the legislators' thing, but they are in fact legislating and regulating it. Educate them on what will impact your profession by their actions.

If you don't have the confidence or desire to speak directly with your elected representatives, then write a check to our PAC so we can speak on your behalf and your profession can be heard.

I have heard from some pharmacists that they do not wish to contribute to or associate with a Democrat because they are of a different party, or are unaffiliated. Right now and historically in Connecticut, Democrats control our state. If we are not willing to work with the party in power, then our agenda and goals will never be met. To better understand which officials and candidates are friendly to our profession, our legislative committee has started a questionnaire process of all candidates for these offices. We encourage you to speak as a pharmacist to your elected officials.

The legislative committee is chaired by Angelo Defazio and Rick Carbray. They are always looking for more members to be active on their committee.

Besides, the legislative voice for the profession that the CPA provides, our External Relations Committee has embarked on an ambitious agenda under the guidance of J acqui Murphy. This group is setting up the means to communicate the role of the pharmacist to the general public. Their focus will be to have a group pharmacists willing to speak at schools, PTA's, church groups and other civic clubs.

The natural fit of this group would be to promote our profession and educate the community on issues that are important to them and us. One of first topics to be rolled out is "why does it take so long to fill my prescription?" The most important part of our organization is our members. We need to grow our membership and encourage all pharmacists and technicians to join. Pharmacists and technicians will join if we tell them of the service and worth the CPA has to them.

To the non members out there wondering why you should join, the opportunities exist not only for the association, but your career development.

CPA members are lecturing to future techs at Community colleges;

CPA members are practicing through the organizations pharmacist network PharmNetEx;

CPA members worked with DSS to give better choices to new Medicare D patients;

CPA represents all pharmacists in the state regardless of professional focus.

Our Board of Directors includes staff pharmacists from community pharmacies and hospitals. We have owners, and chain supervisors, educators and clinical pharmacists as well as long term care pharmacists. We even have some board members with industry and PBM backgrounds. CPA does relate to your practice setting and if you don't think it does, then please tell us why.

CPA is the only Connecticut based pharmacy association with any full time staff to immediately address any questions or concerns.

The California Pharmacist Association is launching an Ombudsman position for employee pharmacists. This is designed to be a neutral professional to address the work related concerns of our employee pharmacists. CPA has started a task force to address this issue and collabora te with California to see if this will work in Connecticut too.I want to thank everyone who has worked hard in the past to get us here. We cannot rest on our past successes. We have a large group of professionals that do great things every day. We are comprised of silent heroes in the workplace. We will need to be advocates for our profession in the workplace and in the halls of power. We need to be able mobilize our contacts, which is almost every family in the state, to be our champions. To meet that end, we are only as strong as our active members. The association is always looking for ways to improve the practice of pharmacy at a local, state and federal level. Your contributions will only help not just your career, but your patients and the citizens of Connecticut.

Please, get involved with what affects you and your future.

The future begins NOW.

Emmett Sullivan, RPh, President, CPA Board of Directors

Mid-Winter Conference Deemed a Success



Associates from McKesson chat with Convention attendees during the Lunch Break

Despite the constant onslaught of winter weather in early Fenruary, the day of the Connecticut Pharmacists Association Mid-Winter Conference was clear but cold. Over 250 pharmacists spent the day earning CE credits, mingling with friends and meeting new acquaintances, as well as having access to a variety of vendor booths and the Product Theater sponsored by PriCara on pain management featuring Richard Gannon, PharmD from Hartford Hospital.

"The Mid-Winter is a great venue to mix with industry vendors, get a jump-start on CE credits, and understand what is happening in the Legislature," stated Marghie Giuliano, Executive Vice President of CPA. "With a new Governor and Administration, as well as many new faces in the Legislature, there are many issues facing pharmacy. The Mid-Winter was a great opportunity to bring every-

New England States continued



A full house enjoyed their lunch break in the Aqua Turf's Kay's Pier North Dining Room.

one up to date." Giuliano and CPA Lobbyist Jean Cronin of Hughes & Cronin gave an overview of proposed changes to Connecticut pharmacy law and regulations with an interactive component for the audience of pharmacists who offered suggestions on cost-savings and elimination of waste.

McKesson served as the Platinum Sponsor for the Mid-Winter Conference, and AmeriSourceBergen and Kinray were Silver Sponsors. Saint Joseph College School of Pharmacy served as the Coffee Break Sponsor. The CPA also received booth sponsorship support from the following businesses and organizations: AstraZeneca; Stericycle, Inc.; Guaranteed Returns; Merck; Cardinal Health; Abbott; H.D. Smith; TEVA Respiratory; Rexam Healthcare; Rite-Aid Pharmacy; and GlaxoSmithKline.

Don Zettervall's well-attended lecture on Successful Diabetes Management: Utilizing New Treatment Guidelines received support from Boehringer Ingelheim Pharmaceuticals, Inc., Novo Nordisk, and sanofiaventis. Michael Smith's afternoon program Update on Anticoagulation Management for VTE was supported with an educational grant from Ortho-McNeil Janssen Affairs, LLC.

The CPA also ran a membership drive at the Mid-Winter Conference, offering a \$50 discount to any new member. Over 15 pharmacists took advantage of this special offer and joined the professional association. "It is important for pharmacists to realize that CPA is the voice of the profession," stated Burt Orland, a CPA board member and chair of the Membership Committee. "There is strength in numbers, and whether you work retail, in a hospital, or in research, the actions of the Legislature affect all of us. Membership is a vital way to ensure that your voice as a pharmacist is heard."

Massachusetts President's Message

As I reflect upon 2010, I am particularly grateful for the many achievements of our Association. 2010 brought sev-

eral important changes that will shape the practice of pharmacy for years to come. The Department of Public Health's Drug Control Program engaged in a significant expansion of the Prescription Monitoring Program that will require indi-



off a prescription for a Schedule Christine Perry, President II-V drug to present an

approved form of identification. The pharmacist will be responsible to record data from the ID and upload this data to the PMP on a weekly basis. MPhA was consulted at each phase of the proposed changes and won a concession to have this ID requirement waived for refills. In addition, MPhA requested and was assured that pharmacists would have access to the PMP patient data in concert with or immediately following the implementation of the ID collection and weekly processing requirements. MPhA will continue to exert pressure to ensure that DPH meets this expectation.

2010 was the second and final year of a legislative session that brought glimmers of hope for several MPhA initiatives. Despite considerable opposition, An Act Regulating Pharmacy Audits was reviewed by two committees and received an "ought to pass" recommendation from each. The bill was in the House Ways and Means Committee awaiting a vote from the full house when the session ended. This is a good sign for its prospects in the new session.

MPhA was part of a small business coalition that lobbied for a small business health care bill to relieve pressure on the exorbitant health care premiums that independent

pharmacies must pay. Although we did not get the exact language we had hoped for, the legislature passed a bill that will allow small businesses to join buying groups that will provide leverage for better rates from the insurance industry. MPhA is proud of the role we played to convince the legislature to finally pass this bill despite threats from insurers that the sky will fall if small businesses are allowed to bargain as a collective.

Less successful was our attempt to promote a bill to create a voluntary rehabilitation program for pharmacists and pharmacy interns who succumb to some form of chemical addiction. The current rehabilitation program does not afford confidentiality provisions to those individuals who enroll of their own accord and successfully complete a rigorous program. This, in effect, dissuades those who recognize their addiction and wish to get help for fear that a mark on their permanent record would make them unemployable. In the coming session we will have to redouble our efforts to educate legislators of the public health threat posed by the current punitive program.

MPhA also played a role in securing provisions in the federal health care reform bill that will provide for pilots of health care delivery models that will include pharmacists as providers of medication related services directly to the patient. MPhA members met with members of our congressional delegation to promote these provisions and ensure that they would remain in the bill. We are pleased to have a congressional delegation that has high regard for the value pharmacists can bring to the health care delivery system.

In 2010 MPhA held two very successful continuing education programs our Spring Conference and the New England Pharmacists Convention. These will continue to be staples of our services moving forward and we look forward to adding additional programs in 2011. I invite you attend the Spring Conference on April 27 at the Sheraton Four Points in Norwood. Our convention and conference committee has put together outstanding programming on New Drugs, Diabetes, Pediatric Psychology, Chemotherapy Prescription Monitoring, Healthcare Reform and CMS update. Visit our web site at www.masspharmacists.org for more information or to register.

In addition, MPhA joined the Mass. Dental Society, the Mass Podiatric Medical Society, and the Mass Society of Optometrists to form a working group of member health providers to develop a comprehensive communications program aimed at educating the public and our members regarding the important role that each of these specialties play in diabetes management. We created a special panel presentation including doctors from all four specialties that conducted a special three-hour panel presentation at the 2010 Massachusetts Dental Congress in Boston in January 2011, aimed at improving understanding of what each specialty does in the diabetes management team and when patients should be referred to one of the specialists. The Podiatric Medical Society also hosted the presentation in September at the 2010 APMA Region One Conference. In addition, the working group has also put together a PSA that will be aired in 2011 on select television stations. Check out our Facebook page and YouTube to see the PSA.

2010 also saw a revitalization of our committee structure. Committees are the backbone of any association and help to build a strong foundation and governance structure that meets the goals and mission of our Association. In particular the legislative committee became actively engaged in our policy agenda and meets regularly via conference call. This growing and active group promises to yield substantial benefits for pharmacy in the new session. Our Membership Committee is reviewing numerous proposals to meet our goal of serving and growing our membership. They are focused on providing real value and benefits of membership in MPhA. The Professional Affairs Committee is actively working with the DPH on an Asthma pilot and chronic disease program.

I would also like to thank those of you who donated to the Foundation and Massachusetts PharmPac in 2010. I am pleased to say that every member of our Board has personally donated to both the Foundation and PharmPac. As President, it is an honor to know that we have 100% dedication to our Association from your elected leaders on the Board. I would like to thank former MPhA President Bob Audet who gave a sizeable donation to MPhA. It is through the generosity of our members that we build the funds to provide scholarships and accomplish our legislative goals. Please consider donating to the Foundation or PharmPac, no donation is too small and for your ease can now be made online at www.masspharmacists.org.

These are just a few of the highlights from 2010. As we enter the new year, I am very grateful for the association's many accomplishments, and extend my sincere appreciation to you, our members for your continued support.

New England States continued

New Hampshire

New Hampshire Pharmacists are Recognized at Annual Holiday Party



Pictured from left to right: President, BOP Ronald Petrin and Donald Dickerson

The Massachusetts College of Pharmacy and Health Science at Manchester sponsored the Annual Holiday Reception on December 15, 2010 at the Manchester Country Club. The celebration was sponsored with support from the NH Pharmacists Association, the NH Society of Health-System Pharmacists and the NH Independent Pharmacy Association.

This year, the NH Board of Pharmacy recognized two New Hampshire Pharmacists who have been licensed in the State of New Hampshire for 50 continuous years. The ceremony included the presentation of a framed gold certificate. The "Gold Certificate" itself has been around for well over 30 years, the presentation only became formal in the past 4 years. The gold certificate is a replica of their license that is engraved with the recipient's name, as well as a signed citation from the Honorable Governor Lynch. The gold certificates of licensure were presented by Ronald L. Petrin, President, New Hampshire Board of Pharmacy.

The 2010 recipients were: Donald M. Dickerson and Therese H. Dargie

In addition to the gold certificates, the following 2010 awards were presented:



Pictured from left to right: Awards Chairperson, Maryann Cooper and Cheryl Durand

Cheryl Durand Named Distinguished Young Pharmacist

The Distinguished Young Pharmacist Award is sponsored by Pharmacists Mutual Companies. This award is presented annually to a pharmacist licensed in New Hampshire who has practiced ten years or less, practices in a community, institutional, or consulting pharmacy and who has actively participated in national pharmacy associations, professional programs, state association activities and /or community service.

Cheryl is a faculty member at the Massachusetts College of Pharmacy and Health Sciences Manchester campus. She has held numerous positions in both local and national pharmacy associations. She served as the vice-president of the NH Pharmacists Association from 2005-2007, president of the association from 2007-2009 and is now the immediate past president of the state organization. Since 2008 she has served on the NH Board of Pharmacy Continuing Education Advisory Council and was appointed by the NH Board of Pharmacy to the Joint Pharmaceutical Formulary and Credentialing Committee in 2009.

She is also a consultant for the Apollo Chronic Illness project and the NH Health Information Exchange Planning and Implementation project. As part of her community service initiatives, she serves on the Head Start Health Advisory committee and is an integral part of executing the mandatory health screenings for children entering the Head Start program of southern NH each summer. At the national level, she is involved in the advocacy task force for the American Association of Colleges of Pharmacy.



Pictured from left to right: John Eddy and Bob Gooch

Robert W. Gooch Jr. Receives Bowl of Hygeia

The "Bowl of Hygeia" Award is presented annually by participating pharmacy associations in each of the fifty states, the District of Columbia, Puerto Rico, and the ten Canadian provinces. The recipients are selected by their respective associations for their outstanding record of community service.

The 2010 recipient, Robert Gooch, has served as Trustee of Trust funds for the Monadnock Congregational Church, served as a member of the Advisory Board for Northern Coos Community Health and was the Town and School Moderator for 6 years for the town of Columbia. He has coached youth soccer, elementary basketball, Bambino league baseball, and was Assistant Coach to New Hampshire Lion's Cup All-Star soccer team in 2007. He was also recognized as Coach of the Year in 2006.

This Massachusetts College of Pharmacy graduate has revealed himself as a selfless and dedicated individual to his family and community.

Special awards were also present by Brad Whitney and there was entertainment by "Drummer Bradley and his Party Orchestra" for the second year in a row. Due to space constraints the other award recipients will be highlighted in the spring edition.

The NHPA board members wish to congratulate all 2010 recipients for their commitment and dedication to the profession of pharmacy. Their awards are well-deserved. Lastly, NHPA would like to recognize and thank this year's NH Pharmacy Awards Committee– Paul Boisseau, Maryann Cooper, John Eddy, David Lacoste, Rachel Maynard, Don Messina, Kristine Willett, and Gary Wingate.

In Memoriam - Two New Hampshire Independent Pharmacists

Paul A. Gillis

Paul Andrew Gillis, 79 of Nashua died on November 20, 2010. He graduated from Boston University in 1952 and the University of Connecticut in 1959, after which he became a registered pharmacist. In between degrees, he served in the US Marine Corps, where he rose to the rank of captain.

After moving to Nashua, he bought John's Pharmacy which is now known as Ken's pharmacy in Manchester where he worked every year since. Ken, his son, went to pharmacy school and when Paul stepped down Ken took over and renamed the pharmacy Ken's Pharmacy. Paul continued to work until could no longer work.

This past year, he was honored at the NHBOP Holiday party as one of New Hampshire's few and distinguished 50-plus years. He hand delivered countless prescriptions to the homes of elderly or others who couldn't make the trip into his pharmacy. Paul did well for his patients and had a great following.

He is survived by his wife Jean (Martin) Gillis and four children.

George T. Liamos

George T. Liamos, 77 of Nashua passed way on Tuesday, September 28, 2010.

George was a lifelong resident of Nashua. He graduated from Nashua High School in 1953. He then went on to attend New England College of Pharmacy earning a bachelor degree in Pharmacy in 1962. George served his country in the US Army. He was the former owner of Lussiers Pharmacy, and most recently was employed as a pharmacist for Rite-Aid for 19 years. He worked as an overnight pharmacist in Store 4741 Manchester for many years and up until this past summer, he worked in

New England States continued

Concord Store 4282 in Concord until his retirement this year. The week prior a group of Rite Aid employees had gathered at the Backroom in Manchester for a Retirement Luncheon for him. Funeral services were held at the St. Philip Greek Orthodox Church in Nashua.

He is survived by his wife of 50 years, Lillian (Petropoulos) Liamos and a son Paul.

Both pharmacists will be missed by the communities they served so well. NHPA wishes to extend their condolences to the individual families. Anyone wishing to make a memorial scholarship donation in memory of these outstanding entrepreneurs may do so on our web site www.nhpharmacists.net.

**Information obtained from obituaries found in The Union Leader, Nashua Telegraph and personal interviews with colleagues and friends.

New Hampshire Pharmacists Association Scholarship Committee Announces 2010 Recipients

The NHPA Scholarship Committee conducts interviews with all prospective candidates on the first Wednesday in August every year. Typically, the application process begins in the early spring when the Deans from New England area colleges are contacted about the NHPA program. Student applicants can apply at that time, and the process concludes in June with the final review of the applications. It is open to any pharmacy student in their professional years who is a legal resident of New Hampshire, and interviews are granted in every case. Students are encouraged to visit our website www.nhpharmacists.org to review the application requirements, and can file on their own.

This year, the Committee selected candidates based on the following criteria:

- Scholastic Ability (GPA) Initiative
- Financial Need
- Insight

Volunteerism

- Decisiveness/LogicPersonal Presentation
- Work Ethic (references)
- Involvement in Pharmacy and Pharmacy Trends

During this past year, the following students applied for, and received scholarships from the NHPA, and the following is some of what they have been up to in the past year:

Brenna Mokray, MCP Boston

Brenna is in her 5th year at MCP-Boston. She has been active in the APhA- ASP for 4 years, attended the APhA-ASP regional meeting in Providence, Rhode Island, and was also involved in Generation Rx, a project that raises awareness of misuse and abuse of prescription medications. She is active in her church music ministry, and enjoys long distance running.

Colleen McQuinn, Northeastern University

Colleen is now entering her 6th year at NU and has completed rotations in community pharmacy, infectious disease, internal medicine, and ambulatory care. Her coop at the Brigham and Women's Hospital Anticoagulation Management Service in the fall of 2008 was instrumental in a successful cardiology rotation at the BWH this past summer. She graduates this May, and is currently in the process of scheduling interviews for PGY-1.

Ashley Greene, University of Connecticut

Ashley is now a 5th year student at UCONN, and involved in such initiatives as the Special Olympics, Migrant Farm Workers Clinics, a VNA Collaborative, and became CPR and Immunization certified. One of Ashley's goals is to secure a rotation in Alaska.

We want to congratulate all of this year's recipients, wish them the best both personally and professionally, and remind all pharmacy students who are residents of the Granite State that many factors enter into the scholarship decision process. So explore our website and consider applying and become a student member of the NHPA!

The NHPA Scholarship Committee welcomes feedback and input from colleges, students, pharmacists, as well as from prospective benefactors. To become a benefactor, either in a small or large w ay, contact us through our website, www.nhpharmacists.org.

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Features



By: Diana M. Sobieraj, PharmD Senior Research Scientist University of Connecticut School of Pharmacy

Stefanie C. Nigro, PharmD Assistant Clinical Professor University of Connecticut School of Pharmacy

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Targeted Hypertension Medication Therapy Management in a Federally Qualified Health Center

Abstract

Objective(s): To evaluate the effect of a pharmacist-run hypertension (HTN) medication therapy management (MTM) program on blood pressure (BP) control in patients with HTN within a federally qualified health center (FQHC).

Methods: This is a retrospective before and after study within a FOHC. Adult patients diagnosed with HTN who were unable to achieve a goal BP as determined by and referred to the MTM program by their primary care provider. Patients met with the pharmacy team to receive targeted HTN MTM and education regarding lifestyle modifications as suggested by national practice guidelines during the initial visit. Recommendations to resolve medication related problems (MRPs) were made to the primary care provider. At the one month follow-up visit, BP, MRP status and participation in lifestyle modifications were assessed. Patients were given a BP monitor to be used to self-monitor BP at home. The main outcome of interest was the number of patients who were able to achieve their goal BP (both systolic and diastolic) before and after the program.

Results: Eighteen patients completed the study. Thirteen (72%) patients achieved their goal BP upon completion of the program compared to six (33%) patients who were at goal before participation (P = 0.016). There were significantly more patients participating in sodium restriction after the program (4 vs.14, p<0.002). A total of 15 MRPs were identified, of which 13 (86.7%) were resolved.

Conclusion: A pharmacist-led HTN MTM program had a positive impact on BP control among patients diagnosed with HTN within a FQHC.

Introduction

Defined as a sustained, reproducible elevation in blood pressure (BP), hypertension (HTN) affects approximately 1 in 3 Americans, increasing the risk for cardiovascular, peripheral and renal disease.¹ Despite the availability of safe and effective medications, most cases of HTN are left uncontrolled with an estimated two-thirds of patients unable to achieve a goal BP of <140 / 90 mmHg.² Studies have demonstrated that even modest decreases in systolic blood pressure (SBP) can have significant impact on reducing stroke, coronary heart disease, and all cause mortality risk.²³ The Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-7) encourages clinicians to utilize the knowledge of various health care professionals to help improve patient BP control.2 A 2009 meta-analysis confirms that team-based interventions for HTN lead to substantial improvements in both systolic and diastolic blood pressure (DBP).4 Recommendations made (by pharmacists) to physicians, counseling of lifestyle factors, and the use of HTN treatment algorithms were listed among the most effective team-based interventions. A growing body of evidence suggests that medication therapy management (MTM) conducted by pharmacists can enhance patient outcomes across a variety of disease states.5,6 When focused on HTN management, involvement of a clinical pharmacist can improve medication adherence, BP control and reduce overall medical costs.4,7,8

Pharmacist-run MTM services have been offered within a federally qualified health center (FQHC) since 2007. Approximately 7% of all referrals for adult chronic disease management are related to HTN. The awareness of a need for expanded community resources related to HTN management was raised by a telephone-based community survey.9 Results reported that 36.8% of surveyed residents were informed by a doctor, nurse or other healthcare professional that they have high BP; the most common of the health problems asked on the survey.9 A subsequent internal review of BP control rates in the 1,017 patients diagnosed with HTN at the FQHC showed approximately 40% had a SBP of >140 mmHg and 29% had a DBP >90 mmHg. Although the FQHC was actively involved in quality improvement initiatives there remained a community problem that required additional efforts. Therefore, the providers and pharmacist designed and implemented a HTN MTM program.

Objective

The primary objective of this study was to evaluate the effect of a pharmacist-run HTN MTM program on BP control in patients with HTN within a FQHC.

Methods

Program Description

With the financial support provided through the 2009 American Pharmacist's Association Project CHANCE¹⁰ award, this HTN MTM program was designed and implemented within the FQHC Community Health Center, Inc. (Meriden, CT) in collaboration with faculty and students from the University of Connecticut School of Pharmacy. Family physicians and nurse practitioners provide care to over 7,000 patients within the health center. The patient population is represented by a variety of races and ethnicities including Hispanic/Latino (65%), Caucasian/White (19%) and African-American/Black (9%). Over 1,000 of these patients have current diagnosis of hypertension.

Patients were referred to the HTN MTM Program by their primary care provider, who were instructed to refer patients with a diagnosis of HTN and were not achieving their BP goal. However, patients were not excluded from participation in the program if their BP was at goal at the time of the initial pharmacy visit. Upon referral, the patient was scheduled for a 60 minute initial visit with the pharmacy team which consisted of a student pharmacist in the third or fourth professional year and one of two pharmacy faculty members. Prior to the visit, a targeted HTN medication therapy review11 was conducted by the student pharmacist in collaboration with a pharmacy faculty member to identify medication related problems (MRPs)11 related to HTN. During the initial visit, the patient was interviewed by the pharmacy team and the visit included medication reconciliation of current medications (prescription, over-the-counter, and herbal), self-assessed medication adherence, and knowledge and participation in lifestyle modifications suggested by JNC 7.2 Translation services for non-English speaking patients were provided by the health center via AT&T's language line. The patient's BP was measured by a member of the pharmacy team using the Spot Vital Signs[®] device Model 42NTB-E1, (Welch Allyn, Skaneateles Falls, NY) which is routinely used for vital signs assessment at the health center. In the event of equipment unavailability, BP was measured manually. Based on the patient's preference of topic, the pharmacy team provided patient education using "Your Guide to Lowering Blood Pressure"¹², which was subsequently given the

patient. This guide provides a comprehensive review of strategies to control BP including prescription medications and lifestyle modifications. For non-English speaking patients, the same information was discussed using the guide along with the translator's assistance. A print-out version of the corresponding website, which was available in Spanish, was given to the Spanish-speaking patients.¹³ The patient was encouraged to set at least one self-management goal aimed at improving BP control based on those suggested by "Your Guide to Lowering Blood Pressure".12 After the visit, a pharmacy progress note was written within the electronic health record (eClinicalWorks^M) and when applicable contained recommendations to resolve identified MRPs. The progress note was sent electronically within the electronic health record to the primary care provider for review. In the event of a more urgent situation, the primary care provider was directly consulted during the patient visit.

A 30 minute follow-up visit was scheduled for 1 month after the initial visit. During the visit, medications were reconciled and the patient's BP was measured. The status of previously identified MRPs was assessed as well as the achievement of the self-management goal(s) previously set by the patient. The patient was also given an Omron HEM-711 AC BP monitor (Bannockburn, IL) to be used to self-monitor BP at a frequency determined by the primary care provider. Adult large cuffs were available for patients whose arm circumference warranted a larger size for accurate BP measurement. A step-by-step instruction sheet using text and images was created by the pharmacy team for this program and was used during the visit to demonstrate proper BP measurement technique to the patient. This instruction sheet along with a BP log was given to the patient in their preferred language. The "teachback" method was used to assess patient understanding of the instructions.14,15 This communication technique has been suggested to be effective and to improve patient understanding of information.¹⁴ After the visit, communication between the pharmacy team and the primary care provider occurred as described above.

Study Design

This was a retrospective before-and-after study which was granted an exemption from IRB oversight. Between September and November of 2009, all patients 18 years of age and older with a diagnosis of HTN who received primary care services at the FQHC were eligible for referral to the HTN MTM program. Patients were referred to the program by their primary care provider and continued to receive standard medical care during their participation. Standard medical care at the health center included care provided within the context of the Planned Care, an adaptation of the Chronic Care Model.¹⁶ Through planned care, patients are managed pro-actively by a team that consists of primary care providers, nurses, dieticians, behavioral health providers and other clinical team members. Followup visits were scheduled for 1 month after the initial visit and all visits were completed by December 2009.

Patient demographics were collected using the electronic health record. BP was measured by the pharmacy team during the initial and final visit as previously described. Information regarding medication adherence, participation in lifestyle interventions and progress towards self-management goals was self-reported by the patient during the initial and final visit. The primary endpoint was the percent of patients achieving their goal BP (both SBP and DBP) before and after the program. Goal BP was defined according to current national practice guidelines² as < 130/80 mmHg for patients with diabetes mellitus or chronic kidney disease and < 140/90 mmHg for all other patients. The secondary endpoints included the change in SBP and DBP before and after the program, percent of patients reporting participation in lifestyle modifications before and after the program, self-reported progress towards achievement of set self-management goal(s) after the program, and the percent of MRPs resolved at the time of the final visit. Lifestyle modifications included smoking cessation, reduction in alcohol consumption, sodium restriction, participation in the DASH diet, increased physical activity, weight reduction, and improved medication adherence.^{2,12} Participation in a lifestyle intervention was assessed by asking the patient a yes/no question for each intervention and the number of patients responding "yes"

to each intervention was compared before and after the program. Medication adherence was assessed by asking each patient if they missed any number of doses of any antihypertensive medication over the past 2 weeks. The number of patients reporting "yes" was compared before and after the program. Progress towards achievement in a self-management goal was determined on a case-by-case basis by the pharmacy team. An example of progress was a patient who initially walked 20 minutes two times per week for physical activity and set a goal to increase to 20 minutes 5 days a week, but at the follow-up visit had only increased walking 20 minutes to 4 days per week. Although this patient did not fully achieve their set goal, the patient made positive progress towards achieving the goal. MRPs were identified and classified according to Cipolle et al.¹⁷

Statistical Analysis

Up to 30 patients could be referred to the HTN MTM program based upon the conditions of the Project CHANCE award. Statistical analysis was performed SPSS Version 15 for Windows® (SPSS Inc, Chicago, II). Categorical variables were compared using McNemar's test while continuous variables were compared using a paired ttest. A p-value of <0.05 was considered significant.

Results

A total of 21 patients meeting the previously described criteria for inclusion were referred to the HTN MTM Program between September and December 2009. Of these, 18 (85.7%) completed the initial and follow-up visits within the defined period and were included in the program analysis. Of note, 2 of the 18 patients had seen the pharmacist for MTM prior to this program. The no-show rate for all visits (initial and follow-up) was 12.2%. Patient demographics and characteristics are provided in Table 1. The mean duration between initial and follow-up visits was 30.6 ± 6.97 days.

The HTN MTM program increased the number of patients achieving goal BP (both SBP and DBP) after the program (n=13) compared to before participation (n=6) (P=0.016, Figure 1). The number of patients with SBP at goal also improved significantly before and after the program (P=0.04). While the number of patients with DBP at

Table 1. Patient Demographics and Characteristics Demographic / Characteristic

Age (y, mean±SD)	50.9±10.7
Male (%)	10 (55.6)
Race / Ethnicity (%)	
African American	3 (16.7)
Caucasian	5 (27.8)
Hispanic	8 (44)
Other	2 (11.1)
Diabetes mellitus (%)	4 (22.2)
Chronic Kidney Disease (%)	2 (11.1)
Body Mass Index (mean±SD)	29.4±7.9

Number of prescribed antihypertensives* (mean±SD)2.2±1.3 (mean±SD)

*:in the event where a patient was prescribed a medication that was a combination of more than 1 active antihypertensive agent, each individual agent was counted a 1 prescribed medication.

goal improved, statistical significance was not achieved (P=0.22) (Figure 1). A mean decrease in SBP (-4.8 \pm 14.76 mmHg; P=0.18) and DBP (-3.94 \pm 8.68 mmHg P=0.07) was observed, however they did not reach our priori cut-off for statistical significance.

Figure 2 shows the number of patients self-reporting participation in one of the specified lifestyle interventions before and after the program. There was a significant increase in the number of patients participating in sodium restriction after the program (4 vs. 14, p<0.002). Overall, a total of 34 self-management goals were set by the patients (an average of 1.89 per patient). The most common selfmanagement goals set by patients were related to restricting sodium in the diet and accounted for 21 (61.8%) of all set goals. Other goals set by patients were in regards to decreasing or stopping smoking (n=4), improving medication adherence (n=4), increasing physical activity (n=3), reducing over-the-counter non-steroidal anti-inflammatory use (n=1) and adherence to the DASH diet (n=1). Progress towards achievement of self-management goals occurred in 28 (82.4%) of the 34 set goals. Progress was

Table 2. Types of Medication Related Problems Identified				
Type of Medication Related Problem	No. (%)			
Nonadherence	8 (53.3)			
Need for additional drug	2 (13.3)			
Dose too low	3 (20)			
Dose too high	1 (6.7)			
Adverse Drug Reaction	1 (6.7)			
Total number of medication related problems identified	15			

made in all goals set by patients related to medication adherence, physical activity, over-the-counter non-steroidal anti-inflammatory use and the DASH diet. Of the goals set regarding smoking cessation and salt restriction in the diet, progress was made in 25% and 85.7% of goals, respectively.

A total of 15 MRPs regarding HTN management were identified in 11 patients. The types of MRPs identified are presented in Table 2. A total of 5 recommendations were made to primary care providers in response to these MRPs. The types of recommendations along with acceptance rate are as follows: add additional antihypertensive therapy (n=2, 100%); increase dose of current antihypertensive therapy (n=3, 66.7%); change oral to topical nonsteroidal anti-inflammatory therapy (n=1, 100%). As a result of recommendations made to primary care providers and patient level interventions such as education regarding nonadherence, 13 of the 15 MRPs (86.7%) were resolved.

Discussion

This study was able to demonstrate a positive impact of a pharmacist-run HTN MTM program on BP control amongst hypertensive patients within a FQHC. The study site provided a unique and supportive environment which was considered essential for the demonstrated success of this program. Powered by a statewide electronic health record and a Planned Care, inter-disciplinary construct, the providers at the FQHC are strongly committed to collaboratively improving outcomes in HTN globally and eliminating the existing disparities between racial/ethnic groups. This pharmacist-run MTM service is one such example of this type of collaboration. However, since clinical pharmacy services have been embedded in the Planned Care construct since 2007, providers may be more comfortable working collaboratively with a pharmacist, which may not be the case in environments where pharmacist services have not been established.

Our findings further support evidence that pharmacist-initiated recommendations to providers are an effective teambased intervention.⁴ In this study, the overall acceptance rate for pharmacist-initiated recommendations was high (83%). The electronic health record used by the health center enabled the pharmacist and primary care provider to communicate in an efficient, timely and secure manner, while also enabling the primary care provider to accept the pharmacists' recommendations, support the intervention, and resolve any identified MRPs. Additionally, the Planned Care framework used by the health center, which employs a team-based approach to care and clearly delineated roles, fostered a collaborative team environment.

Although this intervention was not designed to evaluate the impact of pharmacist-run HTN MTM on disparities in HTN management, we feel this is an important area to consider for future research. While treatment strategies for HTN are generally consistent for all patients, cultural considerations, efficacy of medications in different racial/ethnic groups, affordability of medication and access to healthy food choices may hinder optimum BP control. Our patient population was diverse in regards to racial/ethnic groups because all patients, regardless of primary language or race/ethnicity, were eligible for participation. With the use of available translation services, consistent delivery of the intervention across all racial/ethnic groups was made possible. In addition, patients were included in our study regardless of co-morbidities (i.e. diabetes mellitus and chronic kidney disease) or the number of prescribed antihypertensive medications, unlike other similar studies.48,18 Although we agree that these variables may further complicate BP control, our results may be more applicable to the general population that is found in primary care practice. Lastly, the low no show rate, which was much lower than the annual rate observed for pharmacist MTM visits at the study site (51%), allowed for retention of patients in the program for the duration of the study. This may be multifactorial due to the patient incentive of a BP monitor as well as patient perceived value in improving health outcomes. Lastly, we observed that the most frequent medication related problem was nonadherence to medication. This observation is consistent with the MRP rate observed in the pharmacist run MTM service overall, with the majority of nonadherence problems stemming from the inability to understand medication instructions. However, the rate is higher than similar studies of targeted HTN MTM services.^{19, 20} Although it is plausible to suggest that adherence may vary based on factors such as setting, literacy level, or complexity of comorbidities/medication regimen, it is also possible that misclassification of a deeper MRP leading to nonadherence, such as an adverse reaction, may have led to a higher observed nonadherence MRP percent.

Limitations

While this study provided useful information on the effectiveness of pharmacist-run HTN MTM within a FQHC, the small sample size (N=18) and short duration (mean follow-up 30.6 ± 6.97 days) may limit the interpretation of our findings. To increase sample size in the future, patient recruitment may be expanded beyond primary care provider referral with use of reporting from the electronic health record. Given the chronic nature of HTN, evaluation of the long-term impact of such a program on BP control would be valuable. Potential biases included the method of BP measurement, as this was performed by different pharmacy team members, and though predominately digitally measured, some patients were measured using traditional manual techniques. However, all team members were trained to measure BP according to the American



Figure 1. Blood Pressure Control

BP: blood pressure; SBP: systolic blood pressure; DBP: diastolic blood pressure

a: statistically significant improvement with P=0.016 for overall blood pressure comparison and P=0.04 for systolic blood pressure comparison.

Feature Article continued



Figure 2. Patient Participation in Lifestyle Interventions

Patient Participation in Lifestyle Interventions

DASH: Dietary Approaches to Stop Hypertension aP=0.002 for the comparison of sodium restriction

Heart Association's recommendations²¹ and had the opportunity to practice accuracy of skills on a patient simulator arm. In addition, patients were referred by their primary care provider; therefore the risk of selection bias of patients who may be more motivated to implement changes cannot be excluded. Controlling for patient characteristics would enhance the study. In addition, use of an alternative means of medication adherence measurement, such as pharmacy claims data, in place of patient self-report may provide more reliable estimates.

Conclusion

This study demonstrates the positive impact of a pharmacist-led HTN MTM program on BP control among patients diagnosed with HTN within a FQHC. Pharmacists are encouraged to build relationships with health centers that operate in a Planned Care model which is supportive to collaborative, team-based patient care. Long-term effects of such a program need to be evaluated.

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and the Law

This series, Pharmacy and the Law, is presented by Pharmacists Mutual Insurance Company and your State Pharmacy Association through Pharmacy Marketing Group, Inc., a company dedicated to providing quality products and services to the pharmacy community.

You've Been Served!

By Don McGuire, R.Ph., J.D.

The day that you had hoped would never come has come. The sheriff makes his way through the store, with papers in his hand, heading towards the prescription counter. The sheriff says, "Chris, I've got something for you." The sheriff hands you the summons and complaint and walks out of the store. A summons is the notice that a suit has been filed against you. A complaint is the actual lawsuit. Now what do you do?

The most important thing is to not ignore it. This event, service of process, is the start of a procedure that is very time-sensitive. Unfortunately, some defendants read through the complaint and conclude that it is either a bogus case or just a ploy to extract money from them. The worst thing you can do is to toss it aside or throw it in a drawer and forget about it. This is not something that is going to go away. Ignoring it is only going to cause you more problems. In fact, the clock started when the sheriff handed Chris the summons.

Court rules prescribe the time frame within which some sort of response to the summons must be made. Depending on the jurisdiction, this is typically 20 or 30 days, although there are some other limitations out there. If nothing is filed with the court before this time expires, the plaintiff may be able to file for a default judgment. A default judgment essentially says, "You failed to respond, you lose." If the plaintiff gains a default judgment, they can then begin to try to collect the money from you. The worst thing about a default judgment is that there is no deliberation on the facts or the issues of the case. You might end up paying on that bogus case that you tossed into the desk drawer.

The most typical response to a summons and complaint is to file an answer. The answer addresses all of the allegations made by the plaintiff. The responses are usually one of three possibilities; admission, denial, or not enough information. With an admission, you admit that the allegation is true. With a denial, you deny that the allegation is true. The third response is used when you don't know enough about the allegation to admit or deny it. For litigation purposes, this is treated as a denial. A response needs to be made for each and every allegation in the complaint. The answer is also the place where affirmative defenses are raised. These are legal defenses that counteract the allegations against you. For example, raising truth as a defense to slander or libel.

However, there are circumstances when other filings are made instead of an answer. These are generally motions that raise a particular issue to the court. The purpose of these motions is to contest certain issues prior to actually working on the substance of the case via the answer. If you are successful on these issues, many times the case is thrown out and there is no need to work on the substance of the case. The issues contested here can include the lack of jurisdiction by the court, the case is filed in the incorrect venue, the summons and complaint was improperly served, the case failed to name the proper parties, or the case is a duplicate of a previously filed case in another court.

It takes time to evaluate the allegations, decide whether to file an answer and/or a motion and to decide what allegations need to be admitted or denied. Timeliness is your most valuable asset. Don't be an ostrich when you are served. Sticking your head in the sand won't make it go away and ignoring it could result in some serious negative ramifications for you. Call your attorney and/or insurance company as soon as possible. The more time they have to work on your response, the better it will be.

© Don R. McGuire Jr., R.Ph., J.D., is General Counsel at Pharmacists Mutual Insurance Company.

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SIGVARIS

From the Colleges

University of Connecticut School of Pharmacy

Office of the Dean

Dear Friends:

Although I generally use this space to share the accomplishments of our students, faculty & staff (which I do below), I'd like to share my perspective of the crisis facing pharmacy education, unquestionably the most significant challenge we have ever been confronted with. Those of you of my vintage can recall the oversupply of pharmacists we faced in the late 1970s and early 1980s; over the last number of decades, the demand for pharmacists has waxed and waned. What was different about the shortage of a decade ago was the response by a number of institutions who, frankly, saw a financial advantage to pharmacy education and decided to start a program. From our long steady-state of about 72 schools in 2000, we have now added more than 50 schools many of whom are not of the caliber we have come to expect in the academy. Our accrediting body, ACPE, in my view, has not been rigorous enough in enforcing its own standards. It certainly seems that ACPE will eventually accredit any program that applies if the institution remains persistent. What is the result? An oversupply of pharmacists, a shortage of experiential sites, and the graduation into the pharmacy workforce individuals who do not all meet the high standards of competency we expect of a 21st century pharmacist. We have a shortage of deans and faculty, leading to the appointment of individuals without the requisite background, experience, and credentials; can you imagine a medical school appointing a pharmacist as dean as we have appointed physicians to our schools? Some have argued that once we recover from the financial crisis (that has lead to the delayed retirement of some pharmacists) and MTM is in full bloom, we will have the need for all of these individuals; I strongly disagree. In my view, between the unbridled growth of new schools and the overexpansion of existing programs, we will be faced with an oversupply, I fear, for some time to come. What's the answer? First, ACPE must rigorously enforce its accreditation standards in new and historical schools

alike. Second, we in the academy and in practice must make clear to institutions that pharmacy is not a "cash cow." Third, those of us in the academy must become introspective; these schools would not be able to open without deans and faculty to staff them. Some might recall the 1990s report of the Pew Commission that suggested the closure of one-third of the then 72 schools of pharmacy; clearly they were wrong, but so is the current expansion. Many of us have spent our careers working to raise the quality of American pharmacy education; for us, it's a sad day.

Now, let me share some happier news about our students and faculty.

V Foundation Grant

Dr. Kyle Hadden has received a prestigious V Foundation Cancer Research Scholar Award for his project, "A Chemical Biology Approach to Understanding the Anti-Cancer Effects of Vitamin D3." This grant is awarded to a small number of junior faculty nationwide conducting cancer research.

ASHP/ABHP Leadership Award

Prof. Thomas Buckley received the 2010 ASHP/ABHP Leadership Award in recognition of leadership efforts in reducing racial and ethnic disparities in health care. The award was presented at the 2010 ASHP Midyear Meeting.

National Student Exchange Officer

Student pharmacist Eric Zaccaro was selected and has officially accepted the position of National Student Exchange Officer-elect for APhA-ASP. He will serve as the National SEO-elect from January-October 2011 and take over as the National SEO from October 2011-October 2012. Some of his duties will involve serving on the committee that chooses applicants for the exchange programs, promoting involvement in IPSF activities such as HIV/AIDS awareness and Tobacco Cessation Programs, helping to coordinate students with host cites, and providing updates through the IPSF national bulletin and the APhA-ASP Executive Committee.

Rho Chi Clinical Research Scholarship Award

Dr. Soyon Lee, a fellow of Dr. Michael White, has been selected to receive the 2011 Rho Chi Clinical Research Scholarship Award. As National Rho Chi president, I have the honor of presenting the award at the Rho Chi Annual Meeting in March.

PhRMA Foundation Grant

Dr. Bodhi Chaudhuri was awarded a PhRMA Foundation Research Starter Grant in Pharmaceutics.

NACDS Foundation Pharmacy Student Scholarship

Pharmacy student Karolina Prytulo was one of 58 pharmacy students nationwide to receive a NACDS Foundation Pharmacy Student Scholarship. The goal of this scholarship program is "to support the development of future leaders in the chain community pharmacy industry and to recognize pharmacy students who have a strong interest in pursuing a career in chain community pharmacy."

Pharmacy E-Health Information Technology Collaborative

Dr. Marie Smith was appointed as an AACP representative to the newly formed Pharmacy E-Health Information Technology Collaborative. The Collaborative members are committed to creating a comprehensive and unified approach, ensuring optimal integration of pharmacy's requirements and contributions into the electronic health record (EHR).

Faculty Win Equipment Competition

School of Pharmacy Pharmaceutical Science faculty were successful in obtaining two of the five awards available in the university's Major Research Equipment Competition this past fall.

Pharmacy Trivia Night

This past fall, our professional students hosted the first Pharmacy Trivia Night, pitting teams from each of our pharmacy organizations. Each organization raised an entry fee and was asked to select a charity; the combined entry fees were awarded to the charities selected by the winning teams. The winning team was SNPhA, which donated to the American Diabetes Foundation; in second place was LKS, which donated to Project HOPE; and in third place was ASCP, which donated to The Alzheimer's Association.

National Compounding Competition

Later this spring, the school will send its winning team from our internal competition to the First Annual Compounding Competition at the University of Florida. The winning team included Dan DiMeo, Kevin Keller, and Preston Noon (all P2 students). Special thanks to Dr. Robin Bogner who organized the competition.

American Pharmacists Association Editorial Advisory Board

Dr. Philip Hritcko has been appointed to the Journal of the American Pharmacists Association Editorial Advisory Board.

Pharmacy Student Selected for Prestigious FDA Rotation

Pharmacy student Gabrielle Richterman has been selected for a rotation in the Office of Clinical Pharmacology at the Food and Drug Administration. During her rotation, she "will see the entire spectrum of how investigational drugs move through the FDA, in addition to gaining a better understanding of the application of clinical pharmacology to this process."

It's been quite a winter, but at least the groundhog saw his shadow!

Warmly,

Robert L. McCarthy, Ph.D. Dean and Professor

From the Colleges continued



MCPHS students Jason Mordino and Amanda Ferguson are pictured with MCPHS Associate Dean Caroline S. Zeind and Mr. Tsutomu Mukai, representative executive of Shimin Cyouzai Pharmacy.

Massachusetts College of Pharmacy and Health Sciences

Office of the Dean

Hello from Boston! No sooner did we finish up a very busy Fall semester were we right back to business for an even busier Spring semester. There is so much to share from our Boston, Worcester and Manchester campuses, and I hope you will read more below about a recent MCPHS visit to Niigata University of Pharmacy and Applied Life Sciences, as well as our successful 9th annual residency showcase.

First, though, I wanted to congratulate students Matthew Romo and Sharmeen Bashey who won the 2010 School of Pharmacy-Boston American Society of Health-System Pharmacists Clinical Skills Competition on October 28. The winning team won complimentary registration to ASHP's Midyear Clinical Meeting in Anaheim, California in December and a stipend from the Massachusetts Society of Health-System Pharmacists. While at the meeting, Matthew and Sharmeen also represented MCPHS-Boston in the National Clinical Skills Competition.

Submitted by: Douglas J. Pisano, PhD, RPh Dean, School of Pharmacy – Boston Associate Provost for Pharmacy Education

MCPHS Faculty & Students Visit Niigata University of Pharmacy and Applied Life Sciences

Massachusetts College of Pharmacy and Health Sciences (MCPHS) has enjoyed an international collaboration with Niigata University of Pharmacy and Applied Life Sciences (NUPALS) in Niigata, Japan since 2002. During this period, faculty from MCPHS and NUPALS have visited their counterpart institutions and exchanged valuable experiences in practice and research. Caroline S. Zeind, associate dean of Professional and Academic Affairs at the School of Pharmacy-Boston was invited to visit NUPALS for a week in December following a previous visit in 2008. The invitation was also extended to two Doctor of Pharmacy students, making it the first visit by MCPHS students. Amanda Ferguson and Jason Mordino, both Class of 2011 PharmD students, accompanied Dr. Zeind on the international trip.

During the visit, Dr. Zeind, Amanda and Jason gave several presentations to faculty, administration, graduate and pharmacy students in different classes of the pharmacy program at NUPALS. The students co-presented "Students Perspectives on Pharmacy Education at MCPHS", and Dr. Zeind gave two presentations, "Clinical Pharmacy Education in the United States: Present and Future Directions" and "Global Challenges and Advances in the Diagnosis and Management of Tuberculosis." Dr. Zeind was interviewed for a pharmacy journal in Japan following a presentation, and the visit was chronicled in a local newspaper. As part of their visit to NUPALS, the trio toured a Chinese medicine pharmacy, Niigata City General Hospital, and Citizen Dispensing Pharmacy.

MCPHS Hosts 9th Annual Residency Showcase

The MCPHS student chapter of the American Society of Health-System Pharmacists (ASHP) held its Ninth Annual New England Regional Residency Showcase on November 18 in the Richard E. Griffin Academic Center in Boston. Students from Boston and Worcester campuses participated in the event, which featured more than thirtyfive residency and fellowship programs. The showcase provided a forum for students to learn more about residency and fellowship programs by speaking directly with directors and preceptors of the programs, and current residents and fellows. The showcase also allowed the programs to acquaint themselves with the pharmacy students. The showcase was organized by Trisha LaPointe, assistant professor of Pharmacy Practice and advisor of the MCPHS student chapter of ASHP.

University of Rhode Island College of Pharmacy

By Kayla Smith, Johnston, RI, Student Pharmacist The University of Rhode Island College of Pharmacy, Class of 2011



Kayla Smith, URI College of Pharmacy, Class of 2011.

As a pharmacy student and a future health care professional, I've always cared about helping people. In fact, I have been told to treat every patient as if they were one of my own grandparents. Ironically, during my first clinical rotation this summer, I happened to be at the hospital where my Memere (grandmother) was admitted as a patient. My experience shuffling from pharmacy student back to granddaughter taught me a lot about our health care system, the people involved in it, and the power of patient advocates.

Being at a teaching hospital, the medical residents often consulted me when medication-related questions arose about their patients. While rounding with the medical team in my first rotation, I was able to meet many patients, some frustrated with being in the hospital. I tried to empathize with them, knowing that our team was trying to help make them better. I was able to see how hard the young physicians worked to care for their patients, and how much they cared. Being on the health care side of the situation made me realize why it took so long to change a medication dose, to get a patient down for a simple CT scan, or to discharge a patient from the hospital. The effort

From the Colleges continued



Kayla Smith with her "Memere".

put forth every day by the health care team was impressive, commendable, and selfless.

When my Memere was admitted, our family was very concerned about the amount of pain she was in and concerned about the cause. My Memere, we knew, had metastatic breast cancer and we were worried about what this pain meant. The pain medication originally prescribed was not working at all. After almost 12 hours with 10/10 on the pain scale, I asked her doctor if we could try a different agent. However, he wanted to wait a little longer. After 18 agonizing hours, I asked a different doctor who agreed to prescribe her something different. Her relief was instant - our relief followed. The pain problem was solved for the time being. Being a pharmacy student, I knew how easily mistakes could happen in the health care system. Before I left for the evening, I checked with the nurse to be sure her original pain medication would be stopped. She assured me that it would. The next morning, I arrived to find my grandmother extremely drowsy. The night nurse wanted to stop giving the pain medication that was working, because he felt it was too much for her. Looking at her I agreed, but explained how the original medication did not seem to help her pain. They finally agreed to leave her on the stronger agent. If I wasn't there to speak up, my grandmother would have been put back on the original medication that was not working. We found out later that night, she had been receiving both medications during the night shift despite my efforts to ensure this didn't happen,

and the excess sedation was in fact from the dual therapy. Without my insistence, she would have been continued on the medication that wasn't helping her pain, because of a communication error that could have been prevented. It was a breakdown in the system.

This is just one instance of system-related problems that happened. In the following few days, she had 3 CT scans, 1 x-ray, 2 endoscopies, 1 echocardiogram, and still no one had any answers as to what was causing the pain. There were some days when no one told the family why these tests were even being done. After learning she was having an esophageal bleed, I had to intervene when a nurse was about to administer her scheduled anticoagulant. The order had not yet been written to discontinue it due to the bleeding. The doctors on her team had not vet been told the results of the endoscopy that ultimately found the bleed. This was not the last time I had to speak up with regards to her care. Upon discharge, there were a few interventions with missing prescriptions and correcting instructions. Acting only as her granddaughter, I always respected the boundaries of her protected health information.

The system has so much room for error. It is not necessarily a people problem, it is a system problem. What has this experience taught me about our health care system and my future role as a pharmacist? It has increased my awareness of the needs of the patient and their families. To ask if they have any questions. To listen to their concerns. To communicate with them about their healthcare. It also taught me about the importance of patient advocates, whether it be a family member, the patient themselves, or a member of the health care staff. I encourage all pharmacy students and residents, as well as current health care professionals, to be aware of the needs and concerns of patients and their families, because someday you may find yourself on the other side of the bedside.

I would like to acknowledge and thank Professor Anne Hume, PharmD for her guidance and support during this experience.

*The health information shared in this article has been approved by the patient and her family.

Western New England College School of Pharmacy

Office of the Dean

Greetings! We are pleased to share news with you about Western New England College School of Pharmacy's activities and plans.

Accreditation News

Western New England College School of Pharmacy earned Precandidate status from the Accreditation Council for Pharmacy Education (ACPE), paving the way for the School to enroll its founding class of 75 learners beginning in August 2011. The most up-to-date accreditation information and required disclosure language can be found on our website (www.wnec.edu/pharmacy).

The School of Pharmacy has been accepting applications, interviewing applicants, and receiving deposits from its founding class. The School's faculty, staff, and administration are eagerly anticipating the arrival of a new academic year and the first day with the founding class of learners, the class of 2015.

Our New Home

We moved into the Center for the Sciences and Pharmacy in January 2011 and are settling in to the new facilities. The arrival of our founding class of learners this fall will help christen the pharmacy portion of the building, which



A view of the newly designed a trium at WNEC.

is approximately one-third. Our application and simulation floor hosts our multipurpose laboratory for pharmaceutical compounding; a parental laboratory facilitates learning of aseptic technique; and a patient simulation laboratory with two (2) patient simulators is adjacent to an observation classroom. Each of the three auditoriums holds only 82 individuals and has break-out rooms accessible in the rear. Our design will ensure a close learning environment so faculty can interact with the learners as well as have easy access to small group activities.

Growing Our Family

Several folks joined the School of Pharmacy in January and we plan to continue our growth. Currently we are recruiting for four clinical faculty to join the Department of Pharmacy Practice beginning July 1, 2011; the sites for these individuals have already been identified. We are also recruiting for an instructional designer and multi-media specialist to start later this spring to support our academic efforts. This summer we will continue our recruitment process, targeting several more faculty in both departments (Pharmacy Practice and Pharmaceutical & Administrative Sciences) who will join us in July 2012. Our plans also include faculty hires in 2013, in addition to starting our residency programs.

Thank You

The surrounding community, pharmacists and non-pharmacists alike, have embraced the new School of Pharmacy and the support and encouragement we have received has been impressive. We look forward to continuing and cultivating those relationships in the years to come. I look forward to sharing more about the School of Pharmacy in the near future. If you have any questions about our program, please don't hesitate to contact me!

All my best!

Evan T. Robinson, R.Ph., PhD. Dean, School of Pharmacy

Saint Joseph College School of Pharmacy

Saint Joseph College Announces National Accreditation of Its New School of Pharmacy in Downtown Hartford



A street view of the new Saint J oseph College School of Pharmacy in downtown Hartford.

Saint Joseph College announced in January that its new School of Pharmacy received Precandidate Accreditation status for its Doctor of Pharmacy program by the Accreditation Council for Pharmacy Education (ACPE), the third approval required for the school to matriculate students this fall.

"The accreditation from the ACPE confirms the quality of our unique three year, co-educational doctoral program in Pharmacy (Pharm.D.), and opens the doors to a state-ofthe-art facility in downtown Hartford for our first class of students this fall," said Pamela Trotman Reid, Ph.D., president of Saint Joseph College.

Accreditation by the ACPE, the national agency for the accreditation of professional degree programs in pharmacy and providers of continuing pharmacy education, follows the School of Pharmacy's approvals by the New England Association of Schools and Colleges and the Connecticut Department of Higher Education.

The Saint Joseph College School of Pharmacy will offer a three calendar year doctoral degree program to its inaugural class of approximately 68 students in the fall of 2011. The School of Pharmacy is Saint Joseph College's first school located outside of its West Hartford campus, and exemplifies its commitment to the Greater Hartford community as it builds upon its well-regarded health sciences curricula.

"The Saint Joseph College School of Pharmacy will prepare accomplished pharmacists. It will be a school devoted to service, scholarly work, and best professional practices," said Dr. Joseph R. Ofosu, Saint Joseph College Dean of Pharmacy. In addition, the School will collaborate with pharmaceutical companies and government organizations in activities to serve the area's health needs.

Hartford Mayor Pedro E. Segarra said, "Saint Joseph College's new School of Pharmacy will add significantly to the capital city's vitality by bringing students, teachers, administrators and others to downtown Hartford. We are thrilled to have the School of Pharmacy open its doors in Hartford this fall to our future pharmacists."

The Saint Joseph College School of Pharmacy will significantly increase the College's \$73 million impact on the Connecticut economy. The College has completed construction and leasehold improvements on its Hartford 21 facility and plans to add 42 faculty and s taff positions to the Greater Hartford area. "Saint Joseph College's School of Pharmacy is an important economic booster for our area and one that will benefit us for many years to come," said Oz Griebel, CEO of the MetroHartford Alliance.



Saint Joseph College's new School of Pharmacy has received Precandidate Accreditation status for its Doctor of Pharmacy program by the Accreditation Council for Pharmacy Education (ACPE), the third approval required for the school to matriculate students this fall. Pictured here, celebrating the ACPE accreditation are (left to right): James G. Henkel, Ph.D., Associate Dean for Academic Affairs - School of Pharmacy; Pamela Trotman Reid, Ph.D., President - Saint Joseph College; Joseph R. Ofosu, PharmD., R.Ph., Dean - School of Pharmacy; and Anne Lippert, Ph.D., Interim Provost.

Hypertension Therapy Update

Contributors:

"Hypertension Therapy Update" is the first in a series of continuing education articles authored and generously contributed to the Tennessee Pharmacists Association by:

Condit F. Steil, Pharm.D., CDE Professor and Chair Pharmacy Practice Department, School of Pharmacy

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Goal

The goal of this lesson is to discuss hypertension and its medical management.

Objectives

- 1. List goals for hypertension control;
- 2. Chart categories of drug therapy available for hypertension treatment;
- 3. Describe the use of each agent, dosing, and monitoring guideline; and
- 4. Forecast potential direction for future hypertension therapy plans.

Introduction

The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-7 Report) identifies evidence-based treatment steps for the management of hypertension. Blood pressure has been classified into 4 stages; normal (<120/80 mm Hg), prehypertension (120-139/80-89 mm Hg), stage 1 hypertension (140-159/90-99 mm Hg), and stage 2 hypertension (>160/>100 mm Hg). Diagnosis and classification of hypertension are determined from the average of 2 blood pressure readings obtained from 2 separate clinic visits; it is measured with the patient in a seated position, after at least a 5 minute rest. According to JNC-7 guidelines, the blood pressure goal in hypertensive patients without diabetes or any additional compelling conditions is less than 140 mm Hg systolic and less than 90 mm Hg diastolic, or less than 130 mm Hg systolic and less

than 80 mm Hg diastolic in patients with diabetes or chronic kidney disease. Depending on the presence of other comorbid conditions, the individualized goal may be lower. Treatment plans for hypertension have evolved to include combination therapy that targets different mechanisms to obtain optimal levels in blood pressure and possibly limit side effects.

Although the JNC-7 is the most recent report of recommendations, it was released in 2003, and new products and clinical evidence indicate some change will occur with the next review, the JNC-8. The indication from the Joint National Committee website (www.nhlbi.nih.gov/guidelines/hypertension/) is that the JNC-8 will not be released until 2011. One possible direction for the next review may be to recommend combination antihypertensive therapies very early in the treatment plan for a patient with high blood pressure, rather than maximizing the dose of one drug at a time. The role of diuresis, and thiazide diuretics specifically, continues to be a topic of debate with each set of new guidelines. Diuretics improve the efficacy of the other agents for hypertension by limiting fluid retention. Some evidence suggests long term diuretic use may not result in optimal outcomes when compared to other combinations. Another potential shift may be a change in the goal blood pressure levels. The recent ACCORD blood pressure study demonstrated that tight management of blood pressure did not result in improved outcomes in patients with type 2 diabetes. The study design called for the intensively treated group to achieve a systolic blood pressure of <120 mm Hg, and the control group to achieve a systolic blood pressure of <140 mm Hg. A review of the data shows that the average systolic blood pressure achieved in the intensive treatment group was 119 mm Hg and 133 mm Hg in the control group. These results translate into positive outcomes in diabetic patients, due to their systolic blood pressure goal of less than 130 mm Hg.

Blood pressure is the product of cardiac output and total peripheral resistance (TPR). Cardiac output is the prod-

uct of the stroke volume and heart rate.

Pathophysiologic changes that result in hypertension are usually not limited to one abnormality; rather, several changes in the normal function of body systems contribute to the hypertensive condition. Two important systems that work to maintain normal blood pressure are the autonomic nervous system and the reninangiotensin-aldosterone system. The autonomic nervous system maintains regulatory action for the vascular system. Abnormal sympathetic/adrenergic tone contributes to increased peripheral resistance. As a patient challenges his or her vascular system with increased fluid and sodium, renin activity in the kidney, a primary component of compensation, adjusts to the increased volume. Inhibition of renin reduces blood pressure and can reverse albuminuria.

The renin-angiotensin-aldosterone system regulates the balance of fluid volume, electrolytes, and blood volume in the body. Altered/decreased levels of fluid or sodium in the distal tubule of the nephron in the kidney stimulate the release of renin, which activates angiotensinogen to form angiotensin-I (AT-I). Angiotensin-converting enzyme (ACE), in the pulmonary and vascular endothelium, then converts AT-I to angiotensin-II (AT-II). Aldosterone is released from the adrenal gland to induce retention of sodium and water with the goal of maintaining proper fluid and electrolyte balance. However, this renin activity also produces vasoconstriction, sodium retention, smooth muscle proliferation, and increased antidiuretic hormone in the vasculature. The real concern is that abnormally high renin activity is required to maintain balance. While some diseases can cause high renin activity, no specific cause other than poor health habits (high caloric and sodium intake, stressful lifestyle, tobacco use) can be identified in the majority of patients. Abnormally high release of renin over time can result in intraglomerular hypertension, with resulting proteinuria. These changes are chronic in nature and result in endothelial dysfunction and microalbuminuria. Insulin resistance is also a by-product of this long term assault on the kidney.

Therapy of Hypertension

Lifestyle modification should be the initial step of hypertension therapy for all patients. This treatment includes a meal plan such as the DASH (Dietary Approaches to Stop Hypertension) diet that limits sodium intake and facilitates healthy eating. Regular physical activity, according to each individual patient's tolerance level and comorbid conditions, should be included, as should possible weight reduction and stress relief. Smoking cessation, if needed, is also a valuable addition to the treatment plan. All healthcare providers should be prepared to assist and reinforce the message about these health habits.

Several different categories of antihypertensive medications with varying mechanisms are marketed. Today, the clinician can choose from a variety of products that may provide enhanced effects for the specific patient while limiting the side effect of the treatment. Table 1 provides a listing of the medication categories, products, and their dosing.

Types of Anti-hypertensive Medications

The diuretics clinically used for hypertension include thiazide-type, loop, and potassium-sparing agents, and the decision of which to use is based on their mechanism and/or site of action. Baseline renal function and serum potassium are important factors in determining the initial choice of diuretic. Thiazide diuretics are usually the initial or second agent used for hypertension. Combination therapy with other preferred antihypertensive agents work synergistically to minimize the fluid retention of other therapies. The JNC-7 report recommends thiazide-type diuretics as first-line therapy for uncomplicated hypertensive patients.

Hydrochlorothiazide (HCTZ) is the most frequently prescribed diuretic for the treatment of hypertension alone, though not effective in patients with significant decline in renal function. Loop diuretics are the choice diuretic when the patient's glomerular filtration rate (GFR) falls below 30 mL/min, or in a situation where greater diuresis is needed, specifically in a volume overloaded patient with symptomatic heart failure. Potassium-sparing diuretics are the only diuretics that may increase serum potassium; loop and thiazide diuretics typically lower serum potassium based on their site of action. Clinically, potassium-sparing diuretics are combined with a thiazide-type diuretic to balance serum potassium. Alone, these medications have minimal effect on reducing blood pressure.

The various types of diuretics work in different areas of the kidney. Thiazide-type diuretics inhibit the Na+/Clchannel in the distal convoluted tubule of the nephron, whereas loop diuretics inhibit the Na+/K+/2Cl- action in the ascending limb of the loop of Henle. Potassium sparing agents, amiloride and triamterene inhibit the luminal Na+ channels, while spironolactone and eplerenone are aldosterone antagonists. Initially, the drop in blood pressure from diuretics is due to a decreased cardiac output as a result of decreased blood volume. Chronically, the blood pressure reduction is not a result of diuresis.

Diuretics are generally taken once daily in the morning to limit sleep disruption from frequent urination, which can be caused by dosing diuretics in the evening. Low doses are used for the initial therapy and can be titrated up if necessary. For example, when treating hypertension alone, doses >25mg of HCTZ show no additional decrease in blood pressure.

Patients with preexisting gout or uric acid stone disease, severe renal impairment, hepatic dysfunction, and/or electrolyte imbalances require close monitoring, as diuretics can induce flare-ups/worsening of these disorders. Thiazide-type diuretics (except metolazone) are contraindicated in patients with a known hypersensitivity to sulfonamides, though the risk of cross-sensitivity is not well defined. Adverse effects associated with diuretics can include changes in serum electrolytes, such as hypokalemia, hypomagnesemia, hyperuricemia, hyperglycemia, hyperlipidemia, hypercalcemia (thiazides), and hypocalcemia (loop). Photosensitivity has been reported. Some drug interactions of significance include nonsteroidal anti-inflammatory drugs (NSAIDs), which can decrease the antihypertensive effect of diuretics. Diuretics can substantially increase lithium levels by inhibiting lithium's elimination; therefore, lithium levels should be monitored 5 to 7 days after starting or discontinuing a diuretic. Thiazide diuretics are known to inhibit the release of insulin from the beta cells of the pancreas, resulting in hyperglycemia. Baseline blood pressure, serum electrolytes, uric acid, glucose, and lipids should be measured prior to initiating therapy, after 1-2 months, and every 6-12 months thereafter.

An angiotensin-converting enzyme (ACE) inhibitor or an angiotensin receptor blocker (ARB) is recognized as a step one or a step two drug following a diuretic treatment. This staging is dependent on the patient's other compelling indications for therapy, such as chronic kidney disease, diabetes mellitus, heart failure, post-MI, or recurrent stroke prevention. ACE inhibitors can delay the progression of microalbuminuria to macroalbuminuria.

ACE inhibitors inhibit the formation of angiotensin-II by blocking the conversion of angiotensin-I to angiotensin-II. These agents increase bradykinin, which stimulates release of nitric oxide, a vasodilator. ACE inhibitors cause dilation of the efferent arteriole in the renal circulation, which aids in the lowering of blood pressure and long term renoprotective action but can also reduce GFR and induce acute renal failure. ARBs are traditionally prescribed when ACE inhibitor therapies are not tolerated due to side effects such as cough. ARBs inhibit angiotensin-II release by blocking the Angiotensin-I receptor. This leads to a reduction in aldosterone secretion, vasoconstriction, and sympathetic activity. ACE inhibitors are often less effective at lowering blood pressure and may increase the risk of angioedema in African-Americans.

ACE inhibitors and ARBs are generally administered 1 to 3 times daily with or without food. Once-daily dosing can be in the morning or evening, based on patient preference and adverse effects, such as drowsiness. Taking the medication at the same time every day is important. Concurrent food intake may affect the absorption of captopril and moexipril, so dosing prior to a meal is warranted. The effects of blood pressure lowering can be seen within 1 hour of administration, with maximum effects after 6 to 8 hours. ACE inhibitors and ARBs are contraindicated during pregnancy. Use in the second or third trimesters can lead to fetal injury or death.

Overall, ACE inhibitors are well tolerated with few side effects, especially if monitored appropriately. The most notorious adverse effect, often the reason for discontinuation of ACE inhibitors, is cough. This adverse effect is primarily due to the increase in bradykinin activity. Other adverse effects commonly associated with ACE inhibitors include fatigue, headache, dizziness, hyperkalemia, acute hypotension, and gastrointestinal problems. Hematologic effects, such as neutropenia and agranulocytosis, have also been reported. Concurrent use of NSAIDs, potassium-sparing diuretics, and potassium supplements may increase potassium levels. ACE inhibitors can increase lithium levels, due to decreased fluid volume and loss of sodium ions; therefore, close monitoring of lithium levels is recommended. Blood pressure, serum electrolytes, and renal function should be measured at baseline, in the first month, and every 6 months throughout treatment. ARBs are listed as category C for the first trimester of pregnancy and category D for the second and third trimesters, so ARBs should be avoided in pregnancy. ARBs are contraindicated in patients with significant disease of a single, functional kidney.

ARBs are generally well tolerated, with more common adverse effects including dizziness, diarrhea, dyspepsia, hyperkalemia, headache, and upper respiratory complaints. The frequency of cough associated with ARBs is less than with ACE inhibitors. Concurrent use of potassium-sparing diuretics, potassium supplements, or salt substitutes may increase serum potassium levels significantly. Use of ACE inhibitors and/or beta-blockers with ARBs should be avoided in patients with heart failure. ARBs can increase lithium levels due to decreased fluid volume and loss of sodium ions; therefore, close monitoring of lithium levels is recommended. Blood pressure, serum electrolytes, and renal function should be measured at baseline and periodically throughout treatment. Potassium levels should be monitored within the first month of initial therapy and every 4-6 months, due to the potential onset of hyperkalemia.

Direct renin inhibitors (DRIs) are a relatively new category of agents for hypertension. They work within the renin-angiotensin-aldosterone system. This category is not included in the JNC-7, as it was introduced after the release of JNC-7. DRIs directly inhibit renin, which means that little or no contribution will result from the renin-angiotensin-aldosterone-system. Aliskiren is taken once daily and can be taken with or without food. Starting therapy begins with a low dose and is adjusted to goal. Adding an ARB or diuretic to aliskiren can be helpful in lowering blood pressure. DRIs are contraindicated in pregnancy. They have a low adverse effect profile that includes a cough, though the incidence is less than with ACE inhibitors. Diarrhea, dizziness, headache, rash, edema, increased uric acid, and low blood pressure can occur. Aliskiren is metabolized in the liver by the cytochrome P-450 3A4 system, and patients' blood pressure, electrolytes, and renal function should be monitored while on aliskiren.

Beta-blockers are commonly prescribed as an addition to an existing hypertension treatment plan. Beta-blockers are beneficial for patients with concurrent cardiac problems and are indicated for patients with high risk for coronary disease, as well as secondary prevention of MI and heart failure. There are 2 main types of betaadrenergic receptors in human physiology, beta1 and beta2. Beta1 receptors are located on the heart, where activation causes an increase in heart rate, contractility, and conduction velocity. Blockade of these receptors reduces cardiac output. The agents with combined alpha and beta blockade will be considered here with their improved lipid profile.

Beta-receptors have a wide range of functions in the body. Activation of beta1-receptors located in the juxtoglomerular cells of the kidney stimulate the release of renin. Beta2-receptors in the liver increase hepatic-mediated glucose output when stimulated. Beta2-receptors in the lungs induce bronchodilation. Some beta blockers are selective for beta1 effect while others are nonselective and inhibit both the beta1 and beta2 receptors equally. When higher doses of a beta1-selective blocker are given, selectivity diminishes. Highly lipid-soluble beta1-receptor blockers cross the blood brain barrier readily and increase the risk of central nervous system adverse effects. Some beta-blockers also have intrinsic sympathomimetic activity (ISA). Beta-blockers are administered once to twice daily and should be taken at a consistent time.

Atenolol is classified as pregnancy category D and crosses the placental barrier, producing a reduced weight of infants. Beta-blockers are contraindicated in patients with sinus bradycardia. Nonselective beta-blockers are contraindicated in patients with asthma. Betablockers can inhibit the release of insulin from the pancreas, resulting in increased blood glucose levels in patients with type 2 diabetes. Conversely, they can also mask hypoglycemic-induced tachycardia, as it can decrease the individual's awareness of hypoglycemia, which typically presents as dizziness and sweating but may not be visible when a patient is on beta-blocker therapy.

Common adverse effects with beta-blockers are CNSrelated, such as sedation, dizziness, drowsiness, lightheadedness, fatigue, and headache. Other notable adverse effects include bradycardia, hypotension, depression, and sexual dysfunction, especially in older adults. Gastrointestinal effects of constipation, diarrhea, and nausea have been reported but occur less frequently. Beta-blockers have additive effects on heart muscle contractility with nondihydropyridine calcium channel blockers (Diltiazem and Verapamil), amiodarone, and digoxin. Typically, patients taking beta-blockers should be tapered down when they are discontinued and not stopped suddenly. Baseline blood pressure, heart rate, lipid profile, and blood glucose levels should be conducted. Betablockers can increase total cholesterol, LDL-cholesterol, and triglycerides and decrease HDL-cholesterol.

Calcium channel blockers (CCBs) are an additional group of agents for hypertension control. Typically, they are a second or third option, and have less of an impact on cardiovascular disease when compared to other antihypertensive agents. Nondihydropyridine CCBs can be considered for patients who have not tolerated ACE inhibitor or ARB therapy. Nondihydropyridine CCBs may reduce proteinuria. CCBs are structurally classified as nondihydropyridine and dihydropyridine. CCBs block the L-type calcium channel, which results in vasodilation. Nondihydropyridine CCBs primarily cause vasodilation within coronary vessels and have a more depressive effect on cardiac conduction, while dihydropyridine CCBs primarily cause vasodilation in the vascular smooth muscle. CCBs are dosed 1 to 3 times daily and can be taken with food to minimize adverse effects. Low initial dosage is adjusted every 2 weeks to patient tolerance, blood pressure, and heart rate. An immediate-release dosage form is rarely used for the treatment of hypertension. Typically, once-daily calcium channel blocker formulations are dosed in the morning, except for verapamil extended-release products, which are given at bedtime.

CCBs are also contraindicated in patients with sick sinus syndrome or a heart block without a pacemaker. Verapamil is contraindicated in patients with congestive heart failure. CCBs can induce headache, dizziness, nausea, dyspepsia, flushing, and constipation. Nondihydropyridine CCBs are associated with cardiac adverse effects including cardiac conduction abnormalities and bradycardia. Dihydropyridine CCBs have adverse effects related to their relaxing of vascular tone. Dihydropyridine CCBs cause peripheral edema more significantly than the other CCBs. Most CCB drug interactions stem from the cytochrome P-450 enzyme system. Concurrent medications and foods (such as grapefruit juice) that are also metabolized through this system should be used cautiously. Diltiazem and verapamil can inhibit other CYP3A4 substrates, such as statins and theophylline. CCBs inhibit platelet function, resulting in an increased risk for bleeding if used concurrently with anticoagulants, such as warfarin or aspirin.

Although indicated for the treatment of hypertension, alpha1-receptor blockers are rarely prescribed for this indication. They are most beneficial in patients with benign prostatic hyperplasia (BPH). Alpha1-receptor blockers can be a treatment option for patients with both diabetes and BPH. The alpha1-receptor blockers inhibit the effect of norepinephrine on vascular alpha1-receptors. Activation of the alpha1-receptor by norepinephrine leads to vasoconstriction, resulting in an increase in TPR. The alpha1-receptor blockers are preferably dosed at bedtime to minimize the risk of postural hypertension often observed within hours after administration. Initial therapy often starts with a lower dose and can be adjusted to goal.

The alpha1-receptor blockers also cause a mild decrease in neutrophils and white blood cell counts, which is generally not significant. Adverse effects commonly associated with alpha1-receptor blockers include fatigue, malaise, dizziness, shortness of breath, hypotension, edema, and weight gain; palpitations, blurred vision and sexual dysfunction have also been noted. Blood pressure and heart rate should be monitored at baseline and at each visit after initiating treatment. If antihypertensive agents are added, the patient should be assessed for first-dose syncope and postural hypotension. Interruptions in therapy increase the risk; thus, nonadherent patients are not good candidates for this drug. Syncope is managed by having the patient lie down, rest, and receive supportive care as necessary.

Vasodilators induce their action by direct vasodilation of the vascular smooth muscle, producing a significant reduction in peripheral resistance. A reflex action from the baroreceptors to this action is an increase in heart rate, cardiac output and renin release. Candidates for vasodilators should receive diuretics and an agent that reduces adrenergic tone, perhaps a beta-blocker. Side effects include an increased heart rate, water retention, and dermatitis, and some cases report a peripheral neuropathy. Hydralazine may induce a dose-related, reversible lupus-like syndrome. Minoxidil can cause a hypertrichosis reaction.

While indicated for the treatment of hypertension, central-acting alpha-adrenergic agonists are rarely prescribed for this indication. Central-acting alphaadrenergic agonists stimulate alpha2-receptors in the brain to inhibit the production of serotonin, dopamine, norepinephrine, and epinephrine. This inhibition produces decreased heart rate and TPR. Central-acting alpha-adrenergic agonists are available in tablets and a transdermal patch (Catapres®). Tablets are taken in daily divided doses, preferably at consistent times. Transdermal patches are applied once weekly. Clonidine is classified as pregnancy category C and should be avoided. Methyldopa is pregnancy category B and can be used in pregnancy. It is converted to alpha-methylnorepinephrine, a natural by-product of catecholamine breakdown, which may also limit its use in gestation. The use of a monoamine oxidase inhibitor (MAOI) is contraindicated in patients taking methyldopa as hypertensive crisis reactions have been reported. Central-acting alpha-adrenergic agonists are contraindicated in patients with severe coronary insufficiency, recent MI, cerebrovascular disease, and renal or hepatic dysfunction. Side effects can include nau-

Table 1: Oral Hypertensive Drugs

Thiazide diuretics	chlorothiazide (Diuril)	125-500	1-2
	chlorthalidone (generic)	12.5-25	1
	hydrochlorothiazide		
	(Microzide, HydroDIURIL)	12.5-50	1
	polythiazide (Renese)	2-4	1
	indapamide (Lozol)	1.25-2.5	1
	metolazone (Mykrox)	0.5-1.0	1
	metolazone (Zaroxolyn)	2.5-5	1
Loop diuretics	burnetanide (Burnex)	0.5-2	2
	furosemide (Lasix)	20-80	2
	torsemide (Demadex)	2.5-10	1
Potassium-sparing	amiloride (Midamor)	5-10	1-2
diuretics	50-100	1-2	
Aldosterone	eplerenone (inspra)	50-100	1-2
receptor blockers	spironolactone (Aldactone)	25-50	1-2
Beta Blockers	atenolol (Tenormin)	25-100	1
	betaxolol (Kerlone)	5-20	1
	bisoprolol (Zebeta)	2.5-10	1
	metoproiol (Lopressor)	50-100	1-2
	metoprolol extended release (Toprol XL)	50-100	1
	nadolol (Corgard)	40-120	1
	propranolol (Inderal)	40-160	2
	propranolol long-acting (Inderal LA)	60-180	1
	timolol (Blocadren)	20-40	2
BBs with intrinsic	acebutolol (Sectral)	200-800	2
sympathomimetic	penbutoloi (Levatol)	10-40	1
activity	pindolol (generic)	10-40	2
Combined alpha-	carvedilol (Coreg)	12.5-50	2

and BBs	rect Renin aliskiren (Tekturna)				
Direct Renin Inhibitors					
ACEIs	benazepril (Lotensin)	10-40	1		
	captopril (Capoten)	25-100	2		
	enalapril (Vasotec)	5-40	1.2		
	fosinopril (Monopril)	10-40	1		
	lisinopril (Prinivil, Zestril)	10-40	1		
	moexipril (Univasc)	7.5-30	1		
	perindopril (Aceon)	4-8	1		
	guinapril (Accupril)	10-80	1		
	ramipril (Altace)	2.5-20	1		
	trandolapril (Mavik)	1-4	1		
			<u> </u>		
Angiotensin II	candesartan (Atacand)	8-32	1		
intagonists	eprosartan (Teveten)	400-800	1-2		
	irbesartan (Avapro)	150-300	1		
	losartan (Cozaar)	25-100	1-2		
	olmesartan (Benicar)	20-40	1		
	telmisartan (Micardis)	20-80	1		
	valsartan (Diovan)	80-320	1-2		
CCBs-non-	diltiazem extended release	10151051			
Dihydropyridines	(Cardizem CD, Dilacor XR, Tiazac)	180-420	1		
	diltiazem extended release (Cardizem LA)	120-540	1		
	verapamil immediate release	10000			
	(Calan, Isoptin)	80-320	2		
	verapamil long acting				
	(Calan SR, Isoptin SR)	120-480	1-2		
	verapamil (Coer, Covera HS, Verelan PM)	120-360	1		
CCBs-	amlodipine (Norvasc)	2.5-10	1		
Dihydropyridines	felodipine (Plendil)	2.5-20	1		
	isradipine (Dynacirc CR)	2.5-10	2		
	nicardipine sustained release (Cardene SR)	60-120	2		
	nifedipine long-acting				
	(Adalat CC, Procardia XL)	30-60	1		
	nisoldipine (Sular)	10-40	1		
Alpha-1 blockers	doxazosin (Cardura)	1-16	1		
-grin i esterni d	prazosin (Minipress)	2-20	2.3		
	terazosin (Hytrin)	1-20	1.2		
heated alche 0			-		
Central alpha-2	clonidine (Catapres)	0.1-0.8	2		
agonists and other	clonidine patch (Catapres-TTS)	0.1-0.3	1 wkly		
centrally acting	methyldopa (Aldomet)	250-1,000	2		
árugs	reserpine (generic)	0.1-0.25	1		
	guanfacine (Tenex)	0.5-2	1		
Direct vasodilators	hydralazine (Apresoline)	25-100	2		
	minoxidil (Loniten)	2.5-80	1.2		

Table 1: Oral Hypertensive Drugs continued

sea, vomiting, constipation, dry mouth, and CNSrelated effects, such as sedation, weakness, nervousness, dizziness, and drowsiness. Hypotension, sexual dysfunction, and hair thinning/loss have been reported.

Iron can decrease the absorption of methyldopa up to 66%. Therefore, iron should be separated by at least 2 hours from methyldopa administration. Methyldopa also increases the risk of lithium toxicity, even in the presence of normal lithium levels. Signs and symptoms of lithium toxicity, such as lethargy and muscle weakness, should be monitored. Over-the-counter drug products containing pseudoephedrine and ma huang (ephedra, ephedrine) can increase blood pressure. This is greatly enhanced for patients taking-methyldopa and clonidine. Tricyclic antidepressants, e.g., amitriptyline and imipramine, may antagonize central alpha2receptors. Clonidine and methyldopa should also be used cautiously with beta-blockers, since withdrawal of these agents in patients concurrently on betablockers has led to life-threatening increases in blood pressure. Patients should be monitored for signs of depression at clinician visits. When stopping the drug, gradual tapering of the drug should occur over several days to prevent withdrawal.

Summary

Several agents are now marketed to control blood pressure to the desired range. However, little improvement in overall control has been noted, and further efforts are needed to encourage patients to continue to follow proper meal plans, engage in regular physical activity, and take their medications. Continual patient instruction about emerging techniques is vital. The future changes and updated recommendations brought forth by the JNC-8 will be interesting to observe.

Correspondence Course Quiz



- 1. A 54 year-old male has a blood pressure reading in your pharmacy of 152/94 mg Hg. How would you classify this blood pressure reading?
 - A. Prehypertension.
- B. Stage 1 hypertension.
- C. Stage 2 hypertension. D. Normal blood pressure.

2. New data indicates:

- A. Diuretics are not effective in blood pressure control.
- B. Single drug therapy to the maximum effective level is preferred.
- C. Use of more than one medication with gradually increasing from small doses is effective.
- D. All antihypertensives result in lowered potassium serum levels.

3. Renin is released secondary to:

- A. Decreased sodium and/or fluid in the distal convoluted tubule.
- B. Increased potassium levels in the loop of Henle.
- C. Increased sodium and/or fluid in the distal convoluted tubule.
- D. Decreased sodium and/or fluid in the proximal convoluted tubule.

4. Thiazide diuretics lower blood pressure in patients with hypertension. The mechanism(s) for this action are:

- A. Reduce alpha adrenergic tone and decrease heart rate.
- B. Reduce fluid levels through diuresis and additional activity on blood vessels.
- C. Reduce fluid levels through diuresis and a central nervous system action to decrease alpha adrenergic action.
- D. Reduce fluid levels through diuresis and reduce cardiac output by decreasing heart rate.

5. Beta blockers actions:

Your Name

- A. Can reduce hepatic glucose output.
- B. Can directly cause bronchodilation.
- C. Can increase LDL-cholesterol levels.
- D. Can reduce renin release in the kidney.

6. Angiotensin converting enzyme inhibitors:

- A. Routinely increase heart rate by direct stimulation.
- B. Exert selective action on Beta-2 nerves in the vascular smooth muscle.
- C. Cannot be given concurrently with thiazide diuretics.
- D. Can produce a chronic cough.
- 7. Calcium channel blocking agents can cause all but which of the following? A. Peripheral edema. B. Altered INR results in patients
 - B. Altered INR results in patients taking warfarin.D. Worsening of heart failure.
 - C. Stimulation of renin release.

8. Alpha-1 blockers:

- A. Can induce a syncopal episode with the first dose of the medication.
- B. Are effective for benign prostatic hypertrophy.
- C. Cause lowered blood pressure through their effects of limiting norepinephrine action.
- D. A and B.
- E. All of the above.

9. Which of the following is/are good patient teaching tips for methyldopa?

- A. Take the medication at the same time each day if possible.
- B. Report any new medications added to your regimen to your primary physician.
- C. Take your methyldopa in the morning with your other medications, including iron if prescribed.
- D. A and B.
- E. All of the above.

10. Which of the following is considered a cardiovascular risk factor?

- A. Routine aerobic physical activity of 45 minutes per session five times a week.
- B. Women aged 56 years old with no other cardiovascular event history.
- C. Presence of microalbuminuria.
- D. Body mass index of 26 Kg/m2.

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